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ABSTRACT

A survey was administered in 1979 to people whose occupations involved them in various aspects of rural mental health services; its purpose was to collect information for the development of approaches for improving the transfer of information in applied research fields. Using a variety of sources to identify potential study members (researchers, practitioners, and/or policy makers), a national sample of 9,000 people was selected to receive the survey. Data collected from 1,666 respondents describe information-seeking behavior, sources used to obtain information about various topics, and the use and value of these sources by or to individuals in different work roles and settings. This document comprises: (1) an introduction covering the use of information sources and knowledge transfer structures; (2) methodology for describing information-seeking behavior including survey format, sample selection strategy, and responses to the survey; (3) the use and value of information sources including major sections on general information-seeking behavior characteristics, quality rating of information sources, and a summary of findings; (4) information exchange among individuals including contact initiators and receivers, person-to-person communication networks, and a summary of findings; (5) a general discussion; and (6) references. The survey form is appended and numerous tables and figures support the report. (THC)

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Knowledge Transfer in an Applied Research/ Service Delivery Setting

The MITRE Corporation
MTR-82W122

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MITRE Technical Report
MTR-82W122

Knowledge Transfer in an Applied Research/ Service Delivery Setting

John Salasin
Toby Cedar

August 1982

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ABSTRACT

The area of rural mental health services delivery was used as a test-bed to study the transfer of information in a field that includes researchers, policy makers, and practitioners. Findings from a nationwide survey (n=1666) describe the sources that are used to obtain information about various topics and the use and value of these sources by or to individuals in different work roles and settings. Survey results were also used to conduct an extensive analysis of the structure of the person-to-person communication network that links individuals in the field.

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1.0 INTRODUCTION

Technology transfer, the process of transfering knowledge to its intended users and translating the knowledge into useful products or programs, concerns many federal agencies. During the 1960's, support for the dissemination and utilization of knowledge emerged as a function of government distinct from research and development (R&D) (Havelock and Lingwood 1973). It has been estimated that 4.5% of the funds allocated for research and development in fiscal year 1975 were spent for activities that were explicitly labeled technology transfer or research utilization (National Science Foundation 1975).

Federal activity has been matched by a growth in the literature addressing the diffusion and utilization of knowledge (Glaser 1976). Numerous studies have identified factors that affect the transmission and use of information or have proposed strategies for increasing information flow and utilization. Most of these studies have examined well-defined disciplines or narrow fields of activities. Less attention has been directed toward the communication systems in applied fields of knowledge that include researchers (or knowledge producers), practitioners, and policy officials.

It is particularly important for agencies that conduct or sponsor research that is not intended for their own use to have an effective knowledge transfer process. Research results in the areas of health or mental health services, solar energy, or agriculture, for example, are generally used by organizations or people outside the federal government rather than by the agency that sponsored the research. Since the agency cannot directly control the utilization of knowledge, special efforts are required to reach and inform the individuals who can apply the results.

This paper describes how individuals working in a field that includes applied researchers, service providers (or practitioners) and policy makers seek information about that field. The research reported in the paper was undertaken by MITRE to collect information that would be useful in developing approaches for improving the transfer of information in such fields. The results are based on 1,666 responses to a mailed survey that was administered, in 1979, to people whose occupations involved them in various aspects of rural mental health services, the topical area that served as a test bed for the study. Questions in the survey addressed: (1) respondents' characteristics (e.g., the amount of time spent in various work activities); (2) the respondents' use of various information sources; (3) the relative importance of these sources to the respondents; and (4) personal contacts initiated by respondents to seek advice from individuals outside of their organization.

This research extends the communications literature by examining the information exchange in an applied field of activity--rural mental health services. The findings describe the:

- sources of information used by the respondents to collect information regarding various topics;

- use and value of these sources by or to respondents in different work roles and work settings;
- structure of the person-to-person communication network linking individuals in the field in terms of its connectedness, centrality, homogeneity, and differentiation.

1.1 Background

Federal agencies attempt to facilitate the transfer of knowledge in a number of ways, according to a National Science Foundation study done in 1975. They use field staff and conduct demonstrations; sponsor workshops and seminars; distribute abstracts and reports; use newsletters and advertising; and rely on the R&D performers for dissemination. All the agencies studied used at least three of these methods. In addition, the federal government operates several broad-based information systems, such as the National Technical Information Service (NTIS) of the Department of Commerce and the Defense Technical Information Center (DTIC) of the Department of Defense.

Many studies have highlighted the extent to which research results are not used, or are used only after a considerable delay. Two retrospective studies (Sherwin and Isenson 1966; Illinois Institute of Technology Research Institute 1968) have shown delays of decades between the development of R&D findings and the incorporation of these findings into useful technology. McClelland (1968) reports that, based on his experience with Army utilization of R&D, it could take as much as 10 years from the completion of research to its implementation. The U.S. General Accounting

Office (USGAO) reviewed the utilization of 374 reports on human resources R&D that had been sponsored by the Department of Defense and were published during the years 1973 to 1975. The GAO study indicated that 38% of these reports were not used (USGAO 1977).

Two issues seem to be particularly important as background to this study of knowledge transfer, and to any efforts to improve information transfer mechanisms. First is the question of where people get the information they need and the factors that are related to the use of various information sources. Second are the processes by which information transfer occurs. These two issues are discussed in some detail in the following sections.

The following background material, and the research results reported later in this paper, should be read with the understanding that much valuable information is not obtained through information-seeking behavior that is purposefully directed to narrow, discrete information needs. Particularly in fields of basic science;

> ...the news which comes to the attention of scientists is not restricted to the information obtained when they intentionally 'gather information', as it is called. Fortunately so! For a good deal of news which comes to their attention in unplanned and unexpected ways, during activities undertaken and on occasions sought out for quite different purposes, proves to be of considerable significance to them. (Menzal 1959 cited in Paisley 1980)

1.1.1 The Use of Information Sources

A comprehensive analysis of the factors that are related to the use of sources of information by individuals might follow the framework suggested by Paisley and Hardy (1980). He suggests that the value of information can be defined in terms of attributes of the information and factors related to the setting(s) in which the information is used. The attributes include relevance, timeliness, comprehensiveness, authoritativeness, specificability (distinctness of representation), locatability (distinctness of physical location), acquirability (ease of acquisition, including cost), and useability (suitability of form and content for the intended use) . The value of a piece of information with respect to the above attributes may vary with respect to several factors suggested by Paisley, including:

- the ways in which the information is used; including its use for learning, decision-making, problem solving, calculation, and/or verification.
- characteristics of the individual seeking information; including their preference for cognitive complexity or simplicity, the paradigms with which they structure a field, the extent to which they differentiate and label information.
- social and organization factors; including characteristics of the work team, work organization, and professional disciplinary groups to which an individual belongs.
- task requirements; including whether the problems encountered in a task are recurring or episodic.

Two facts reduce the need to analyze variation in the use of information sources with respect to all of the attributes and factors listed above. First is evidence that an individual's preference for a specific information source is more likely to correspond to his or her estimate of the ease of using the source than to his estimate of the amount of information expected from the source. This finding holds for both research and non-research personnel (Rosenburg 1967). Information sources are selected not to maximize gain in the information obtained but to minimize cost in terms of effort that must be expended to access the information (Gerstberger and Allen 1968). Second, as indicated previously, information-seeking activity is often not triggered by the need to find a single, specific piece of data but is more general in scope. Since much information seeking is not restricted to a narrow topic it should be possible to analyze differences in information-seeking behavior between groups of individuals who, by reason of education, training, and habit, are likely to perceive some information sources to be easier to use than others.

Much of the research on the use of various information sources concentrates on differences between basic or pure researchers, on the one hand, and engineers or technologists on the other. Basic researchers are reported to derive more of their information from scientific literature (75%) than do applied scientists (50%) (Herner 1954). Herner notes however, that organization factors will play a part in determining the choice of information source. Thus, engineers at the John Hopkins School of Engineering, a graduate and undergraduate teaching institution, report that they obtain 80% of their information from the scientific literature. Engineers at the Applied Physics Laboratory, a separate "contract research" division of the John Hopkins University, report that scientific literature provides approximately 50% of their information. Based on the above, it is reasonable to assume that an individual's organizational setting, and whether he is engaged in research or technology, will both play a major role in determining source preferences.

While individuals working in basic research are more likely to use written information sources, and those working in applied research to use oral sources, both groups rely heavily on informal communication mechanisms. The difference in the use of oral versus written materials may be a function of how the fields are organized. Applied research and development projects require face-to-face communication among the members of a project team. Basic research, on the other hand, may require information from colleagues working at other organizations--making it more likely that such communication will occur through the exchange of preprints or correspondence than through conversations. The nature of the work areas implies that scientists will engage in more interorganizational communication than technologists, who rely more on intraorganizational communication (Gerstenfeld 1980).

Numerous studies indicate that the scientists working in a particular field of basic research are in close communication (Crane 1972). As Crane points out, much of the data related to changes in the number of publications in a research area or to the patterns of citations in an area can best be accounted for by a model in which contact between scientists is the major factor. Technologists, on the other hand, keep abreast of their field through oral communication with coworkers in their own organization (Marquis and Allen 1966).

Other studies indicate that individuals working in areas related to human services also tend to rely on person-to-person contact. For example, Tagliacozzo et al. (1971) interviewed directors in hospitals, assistant superintendents in public school systems, and administrators in city governments about the information sources these people used in their most recent typical decision. Their most important sources were internal documents, personal conversations, and telephone conversations. Magisos (1971) found that vocational technical educators prefer to seek out information from personal contact with familiar and convenient sources. Roberts and Larsen (1971) report that practitioners who attempt to initiate innovative mental health care practices tend to get their ideas from other practitioners, rather than from researchers, and through personal contact or correspondence, rather than from journals. The information-seeking behavior of these practitioners resembles that of technologists engaged in development tasks or in resolving technical problems, who tend to get their information from sources internal to the organization (Marquis and Allen 1966; Rosenbloom and Wolek 1970; Johnston and Gibbons 1975; Utterback 1971).

1.1.2 Knowledge Transfer Structures

Applied fields of knowledge differ from basic fields in the social structure(s) through which knowledge is transferred. Applied fields rely on the vertical transfer of information: an exchange of information between researchers, practitioners and others that passes through several different levels of expertise. In contrast, basic fields transfer information horizontally. Knowledge is shared among like individuals (e.g., among psychologists, or physicists) who have about the same level of expertise.

Paisley uses education and public health as examples of deeply stratified vertical transfer systems.

> Beginning with a small group of equally expert researchers, we move one step down to researchers expert in other, adjunct specialities and to graduate students working to develop expertise in the field. Then there are non-researching professors and consultants. Below them we find practitioners of various kinds. Then public decision-making bodies. Finally, the general public, very remote from the new knowledge that will affect it in many ways. (Paisley 1969)

Characteristics of the vertical knowledge transfer process pose several problems that impede communication. The difficulties of linking research and practice have been documented and analyzed for a number of fields. Duncan (1980) has described five differences that impede communication between managers and researchers as follows:

(1) Goals for acquiring knowledge. Managers want to solve specific problems to improve performance. Researchers explain or describe reality in order to understand phenomena.

(2) Basis upon which issues are selected for examination. Managers emphasize relevant short-term organizational operations. Researchers look at the long-range research impact of the issue(s) on their field of research.

(3) Basis for accepting the validity of knowledge. Validity for managers is related to usefulness in problem solving. For researchers, validity is related to the methods and procedures used.

(4) Methodology and procedure. Managers rely on clinical and unstructured observation. Researchers rely on quasi-controlled induction and inference.

(5) Criteria for continued usage. Managers evaluate results and consistency of applicability. Researchers depend on the replication record and attempts at refutation.

Similar barriers have been identified in education (Joly 1967; Magisos 1971). These barriers have also been pointed out by other writers assessing knowledge transfer between scientists and practitioners (Cohen 1959; Mackie & Christensen 1967; Van den Ban 1963).

Language is an additional factor impeding communication between researchers and practitioners. The researcher tends to use esoteric concepts and vocabulary that the practitioner is not well prepared to understand (Joly 1967).

There are a number of studies on communication between researchers and practitioners. Work has been done related to the diffusion of agricultural, industrial, and medical innovations (Coleman et al. 1966; Katz 1961; Rogers 1962). Havelock and Markowitz (1973) studied the transfer of information between decision-makers and researchers in the field of highway safety. Almost all such studies have identified "middlemen" (e.g., agricultural extension agents, marketing departments, drug company "detail men") that bridge organizational and disciplinary boundaries to link the R&D community with knowledge users.

Horizontal knowledge transfer among basic scientists occurs by means of well developed person-to-person communication networks, without the need for a middleman who is outside of a particular scientific community. Contacts across organization boundaries are more frequent for scientists than for technologists (Marquis and Allen 1966; Rosenbloom and Wolek 1970). Scientists tend to associate with others in their discipline through "invisible colleges" (Price 1963; Crane 1972). They exchange visits, meet at seminars and small invitational conferences, and informally exchange written material before publication. They often seek each other out to locate information before searching the literature. Swanson (1966) estimated, based on his experience, that approximately 85% of useful scientific information is exchanged informally and verbally before a bibliographic search is undertaken. A study of British social scientists concluded that the most common method of keeping track of currently published material and of research in progress was some form of personal or informal contact; 37% of the respondents indicated using such contacts while only 18% mentioned the use of formal methods, such as research registers (Skelton 1971).

Studies of scientists participating in invisible colleges have shown that a few scientists were mentioned frequently as sources of information, while the majority were mentioned infrequently or not at all (i.e., communication is "concentrated"). When researchers in the area of rural sociology were asked to identify scientists who had influenced their choice of research problems or with whom they currently discuss their research, 6% of the scientists in the area received 58% of the mentions. Forty-six percent (46%) of the scientists known to be working in the area were not mentioned at all. In an area of mathematics, 6% of the mathematicians received 38% of the mentions, while 34% were never chosen (Crane 1972). Crawford (1970) conducted a similar study in the area of sleep and dream research. In this field, 11% of the scientists received 54% of the choices, 43% were never chosen.

The concentration in invisible college communication is mirrored by concentration in productivity as measured by the number of papers produced by an author (Latka 1926 cited in Price 1963). The number of authors who produce "n" papers is proportional to $1/n^2$. Thus, if 1000 authors produce 1 paper, 250 ($1000/2^2$) produce 2 papers, 111 ($1000/3^2$) produce 3, 63 ($1000/4^2$) produce 4, etc. The pattern of citations to scientific papers shows even greater concentration. In this case, the number of papers receiving n citations is proportional to $1/n^{2.5}$ or $1/n^3$ (Price 1965).

A network of direct and indirect links (Crawford 1970; Crane 1969, 1970; Gaston 1970) exists to form identifiable communication networks in many fields of research. In Crawford's (1970) study of scientists working in sleep and dream research, 73% of the respondents (N = 218) were directly or indirectly connected with one another to form one large network. The core group of scientists (those who interacted with or received contacts from six or more scientists) could transmit information through their informal contacts to 95% of the individuals in the network either directly or through an intermediary. There were several clusters in the network connected by the core scientists; through them information could be transferred to all other scientists in the network. Gaston (1970), in his study of high energy physicists in Great Britain, also found that a core group communicated with each other. All but one of the 23 institutions in which this type of research was being conducted were linked by these individuals. Crane (1972) reported that 78% of all researchers in an area of mathematics and 74% in an area of rural sociology were tied together through informal discussions of research, influence on the selection of problems, student-teacher relationships, published collaborations, and/or collaboration on work in progress.

Based on the above, this study was undertaken to identify the sources of information used by researchers, practitioners, and policy makers involved with rural mental health services and to describe the informal, person-to-person communication network in this field. Special emphasis was placed on describing interorganizational person-to-person communication networks (as are commonly found in the basic sciences) since it was believed that strengthening these networks might provide an effective and efficient means for improving information transfer.

2.0 METHODOLOGY FOR DESCRIBING INFORMATION-SEEKING BEHAVIOR

A national survey was chosen as the method most likely to accurately describe the information-seeking behavior of individuals involved (as researchers, practitioners, and/or policy makers) in the field of rural mental health services. The survey (Appendix A) was designed to collect data on the topics people sought information about and the sources they used to obtain this information. A strategy was developed for identifying a sample of individuals who would be representative of different segments of the population involved with rural mental health. This sample was surveyed and the responses analyzed.

2.1 Survey Format

The survey collected data to describe respondents' information-seeking behavior and to relate this behavior to a number of variables. The survey form included questions about characteristics of the respondents that might influence their information-seeking behavior. These characteristics were the respondents':

- Occupation
- Organization
- Work activities
- Length of time with present organization
- Geographic location of previous organization
- Association memberships.

The survey form also included questions about information sources. Respondents were asked to:

- Identify the general types of information sources they use and rate their usefulness;

- Name the sources which they used the last time they sought advice from outside their own organization and rate the usefulness of these sources;

- Identify specific individuals from whom they had sought information during the year preceding the survey; and,

- Identify the periodicals they read and rate their usefulness.

Given the importance of person-to-person communication, the survey form was designed to collect data for a sociometric analysis. The form listed the names of 200 people--respondents were asked to identify those whom they had contacted for information. Survey respondents also had the opportunity to identify contacts who were not on the list.

Within the limitations imposed by restricting the survey list to a reasonable number (200) of names, an attempt was made to select people who represented different occupations, types of organizations, and geographical locations. This "name recognition" strategy was anticipated to increase the potential for accurately describing the network and analyzing the cross-linkages between people in different occupations, regions, etc. The strategy forced all survey respondents to consider whether or not they had contacted each individual on the list. It was assumed that this strategy would provide more detail about communication patterns than would an open-ended question that requested respondents to name their contacts without requesting them to consider whether or not they had communicated with a defined set of people.

Most of the people on the survey list were chosen because they were likely to be important sources of advice; they are referred to below as "potential influentials." Some people who were not likely to be sources were included in the list in order to provide baseline data for use in interpreting survey results.

The names of the potential influentials were taken from several sources. The first was a list of people recommended for participation in a 1978 workshop on research issues in rural mental health. The recommendations were made by:

- Members of a Rural Mental Health Work Group at the National Institute of Mental Health (NIMH);
- Health and Human Services (HHS) regional office staff, and
- Economic Development Division staff at the United States Department of Agriculture (USDA).

The people recommended for the workshop were knowledgeable about at least one of five major problems in providing mental health services to rural areas: lack of transportation, coordination, advocacy, difficulties in recruiting and retaining staff, and problems caused by rules and regulations. They came from a wide range of positions, occupations, and organizations in rural areas across the country. These people constitute one group of potential influentials.

A second group of potential influentials included people who held important organizational and association positions. This group was comprised of NIMH Work Group members, mental health specialists in each HHS regional office with rural responsibilities; heads of associations whose activities are related to rural mental health services; and officials of relevant state agencies.

To insure that researchers were included on the list of potential influentials, the papers from two conferences were scanned for their relevance to rural mental health. These conferences were the Rural Sociological Association annual meeting (September 1978) and the American Public Health Association annual meeting (November 1978). The names of the authors of those papers that appeared most relevant to rural mental health were selected.

The list of names on the survey also included some people with low professional visibility; in other words, people who do not fit into the groups described above. This group was randomly selected from participants in the University of Wisconsin Extension Summer Study Session in 1978. Most of these participants were service providers. It was anticipated that they would be asked for advice less frequently than the potential influentials. Their names were included for two reasons: to provide baseline data that could be used to interpret the survey results and to provide a check on survey validity. Three names on the list were "made up" to provide an additional validity check.

Respondents were asked to indicate which of the following statements was most appropriate for each person on the list.

a. I have never heard of this person.

b. I am familiar with the name, but have never had any contact.

c. I have had contact with this person, but have not sought advice from him/her.

d. I have sought advice from this person within the last year.

If the respondent checked Item d, he/she was asked to indicate the number of contacts with that person in the past year and the topic(s) of the contact(s). Survey respondents were also asked to identify people whom they had contacted for advice related to rural mental health issues if those people were not on the list, and to record the number and topics of these contacts.

2.2 Sample Selection Strategy

The number and identity of people working either directly or tangentially in rural mental health are undocumented. Therefore, the boundaries of the universe, defined as all people who are potential participants in a network, are unknown. As a result, it was necessary to develop a strategy for analyzing the communication network--those people who are empirically found to be linked together--that was paired with, and complementary to, a strategy for identifying the universe. Network analysts who study small group behavior, informal systems in organizations, kinship structures, or power elites generally work with universes that have well defined boundaries. Indeed, the boundaries of the universe and the network are often coterminous. The setting for this research does not have that advantage. The approach used by Crane (1972) was to define the universe as those individuals who had authored or co-authored at least one scientific paper in the field being studied. Such an approach is not suitable when the universe is expected to contain a large number of individuals who do not publish.

The universe potentially includes a large number of people from different disciplines, occupations and types of organizations who are either isolated or are part of the network because of a contact with only one person. In this context it would be inappropriate to rely on an approach that identifies a small number of individuals, asks them to name their contacts, and then goes on to their contacts with the same question. This "snowball" strategy would produce a network with a high degree of cohesion and, probably, concentration. It would eliminate isolates from the analysis. The network description would be merely an artifact of the methodology. Since the strategy provides no information about the universe, it would be impossible to determine how many people are left out of the network.

A variety of sources were used to identify potential members of the universe who should receive the survey. Some of the sources provided names of individuals who were clearly involved in rural mental health services. For most of the sources, however, only a possible connection between the names and rural mental health could be inferred. The sources used can be grouped into the four categories described below.

1. Random samples from among the members of ten relevant professional associations (e.g., American Psychological Association) who lived in rural areas (based on zip code location). Approximately 3,400 names were sampled from these associations.

2. Names from conference attendance lists, membership lists, mailing and subscription lists of periodicals and clearinghouses, and lists of state officials and association

officers. These lists were used in their entirety, but selection of the source required inferential judgement. Approximately 3,200 names were obtained from these sources.

3. Members of the Association of Rural Mental Health, directors of Community Mental Health Centers in rural areas, federal staff, authors of books and articles, and other people about whom the project staff had background information. These people could, prior to survey returns, be definitely identified as part of the target population. Approximately 1,200 people are in this category.

4. The survey questionnaire. The respondents were asked to name the people, in addition to those listed in the survey, whom they contacted for advice related to rural mental health within the past 12 months. These names were recorded and survey forms sent to the people who were not among those originally identified. There were a total of 1,367 people in this group.

In sum, about 9,000 people were selected to receive the survey form. Of those, enough information was obtained for about 2,500 people, those in the third and fourth groups, to be able to say with any certainty that they belonged in the universe prior to survey administration.

2.3 Response to the Survey

Survey findings about information-seeking behavior should be interpreted in light of who responded to the survey. This section presents two aspects of the responses. First, the results of the process used to identify the universe are assessed by comparing the response rates of the different sources of names. Second, the composition of the sample that was obtained is described in terms of the distribution of respondents' work roles, work settings, and professional affiliations.

2.3.1 Response Rates by Sources of Names

The response to the survey varied widely according to the source of respondent names. The best response came from those people identified through work of the research project staff (Those in categories 2 and 3, above). Twenty six percent (26%) of these people returned surveys. The return was much lower for the other two groups: 12% for people identified by survey respondents (Category 4) and 11% for the association members (Category 1). The overall response rate was 18% (Table I).

Among the individuals identified by project staff, those who were known to be involved in rural mental health had the highest response rates (Table II). These include: participants in previous project activities (50%), heads of relevant organizations (50%), federal officials (43%), and people who published papers or made conference presentations (41%). Organizations with a general mental health focus generally exhibited lower response rates. For example, the response rate was 27% from the National Council of Community Mental Health Centers membership list, 16% from the Association of Mental Health Administrators, and 10% from the National Association of State Mental Health Program Directors.

One technique for determining if individuals who were highly involved in rural mental health did respond to the survey was to examine the relationship between response rates and some measure of involvement in rural mental health. An individual's name could appear on more than one list; for example, an individual may have

TABLE I

RESPONSE TO SURVEY BY MAJOR SOURCE CATEGORIES

Source Categories	Number of Surveys Sent	Response Rate
Identified by Project Staff	4365	26%
Identified by Survey Respondents	1367	12
Association Membership Lists	3432	11
All Categories	9164	18

TABLE II

RESPONSE RATE BY STAFF-IDENTIFIED SOURCES

Sources[a]	Number of Surveys Sent	Response Rate
Participants in Previous Project Activities	301	50%
Heads of Organizations	6	50
Federal Officials	77	43
Publications or Conference Papers	144	41
Association for Rural Mental Health	473	37
Meeting Attendance Lists	421	34
National Council of CMHC's (Board and Councils)	52	31
National Council of CMHC's (Membership)	314	27
USDA - Rural Health List	46	26
Idea Interchange	284	25
Human Services in the Rural Environment	506	25
Directors of Rural CMHC's	314	24
County MH Boards - Chairpersons	108	17
Rural American Women	46	17
Association of MH Administrators	352	16
National Clearinghouse for Alcohol Information	198	16
Rural Community Psychology Program - CA School of Professional Psychology	140	16
National Association of State MH Program Directors	62	10
National Rural Center - Health Newsletter	382	9
State MH Officials	207	8
Southern Rural Development Center	21	5
Directors of HSA's	82	4
National Association for Retarded Citizens - Executive Officers	46	4

[a] These are not mutually exclusive categories.

participated in a project-organized activity and also have been head of an organization. The number of sources (each of which represented participation in a relevant activity or organization) for each name was recorded. The data for 4,175 individuals were analyzed to determine if the number of sources per individual was related to the response rate. It was found that the number of sources had a positive association with response. The more frequently people came to staff attention in the search, the more likely they were to return surveys. Thus, individuals identified through only one source had a response rate of 18%, while those whose names were obtained from 5 or more sources had a response rate of 69% (Table III).

The response rates obtained from samples of association mailing lists varied (Table IV). Associations with a better than average response rate (11%) included the American Psychological Association (16%), the American Orthopsychiatric Association (16%), and the American Association on Mental Deficiency (15%). Lower response rates were obtained from the American Nurses Association (6%), American Psychiatric Association (7%), and American Public Health Association (7%). Those associations whose members are concerned specifically with mental health service delivery (as opposed to health service delivery and mental health treatment) tended to have higher response rates.

Survey forms were sent to 1,367 people who initial survey respondents identified as sources of information and who were not

TABLE III

RESPONSE RATE BY NUMBER OF SOURCES

Sources	Number of Surveys Sent	Response Rate
1	3497	18%
2	466	35
3	136	42
4	44	48
5 or more	32	69

TABLE IV

RESPONSE BY SAMPLED ASSOCIATION MEMBERSHIP LISTS

Association	Number of Surveys Sent	Response Rate
American Psychological Association	400	16%
American Orthopsychiatric Association	300	16
American Association of Mental Deficiency	113	15
National Association of Social Workers	367	14
American Public Welfare Association	194	13
Medical Health Association	347	9
American Medical Association	400	8
American Public Health Association	306	7
American Psychiatric Association	206	7
American Nurses Association	399	6
All Associations	3032	11

already on the survey mailing list. The percentage of survey responses was slightly higher for people who were cited by two or more of the initial survey respondents (16%) than from those people who were named by one respondent (12%) (Table V).

The overall, low response rate reflects characteristics of the sources. Some sources were only peripherally related to rural mental health. Examples of such sources are Health Systems Agencies, the Southern Rural Development Center, and Rural American Women. Although we anticipated a low response from these groups, they were used because one goal of the research strategy was to identify representatives of all groups that participate in the communications network. Another factor influencing the return rate was the accuracy of addresses. Many people listed by respondents in the survey form were difficult to trace and there was little certainty that a survey sent to these people would be received. Membership and mailing lists also contained inaccurate addresses. In contrast, addresses were more likely to be correct for people known to the project staff.

The analysis of response rates indicates that the universe of individuals involved with rural mental health services is broad and diverse. It includes at least some members of all potentially relevant professional associations. Further, the response rates are directly related to the extent to which individuals are concerned with the delivery of mental health services (as opposed to health

TABLE V

RESPONSE FROM PEOPLE NAMED IN SURVEY BY NUMBER OF TIMES CITED

Times Cited	Number of Surveys Sent	Response[a] Rate
Once	1225	12%
Two or More	142	16
All Groups	1367	12

[a] Does not include those people who were already on the survey recipient mailing list.

services or community development activities) in rural areas (as opposed to the delivery of services in general).

2.3.2 Characteristics of Survey Respondents

The respondents were asked to describe themselves by work role and organization, to indicate the length of time they had worked for their present organization, and to estimate the amount of time they spent on various work activities. A large proportion of the respondents (34%) described themselves as managers or administrators. Psychologists and social workers were also well represented; they comprised 17% and 16% of the sample, respectively. Teachers, researchers, psychiatrists, nurses, planners, volunteers, physicians, or students each accounted for 6% or less of the respondents. Another 11% of the respondents named other roles that, singly, comprise less than 1% of the sample (Table VI).

The largest number (42%) of the respondents worked at local health/mental health agencies, followed by universities (18%). Other work organizations included state governments; state or regional hospitals; city or county governments; the federal government in Washington, D.C. or in a regional office; advocacy groups; health systems agencies; or private practice. Another 14% of the respondents worked at a variety of organizations, each comprising less than 1% of the sample. These organizations included: research or management firms, public schools, private social service agencies, etc. (Table VII).

TABLE VI

RESPONDENTS' PRIMARY WORK ROLE

Primary Work Role	Percentage of Respondents
Manager/Administrator	34%
Psychologist	17
Social Worker	16
Other	11
Teacher	6
Research	5
Psychiatrist	4
Nurse	2
Planner	2
Volunteer	1
Physician	1
Student	1
Total	100% (1645)

TABLE VII

RESPONDENTS' CURRENT WORK ORGANIZATIONS

Work Organization	Percentage of Respondents
Local Health/Mental Health Agency	42%
University	18
Other	14
State Government	10
State/Regional Hospital	4
City/County Government	3
Federal/Washington Office	2
Federal/Regional Office	2
Advocacy Group	2
Health Systems Agency	2
Private Practice	1
Total	100% (1646)

On the average, the respondents had worked for their present organization for 5.5 years. Volunteers, psychiatrists, and teachers tended to have longer tenures, averaging respectively 9, 7, and 6 years in their current situations. People who worked for the federal government in Washington (8 years) or the regions (6 years), universities (7 years), and state governments (6 years) had been with their organizations longer than people who worked for other types of employers (Table VIII).

Most of the respondents devoted a major portion of their work time to activities related to health, mental health, or human services in rural communities (Table IX). They spent, on the average, 72% of their work time in activities related to rural services.

The amount of time devoted to rural services varied according to work role and organization (Table X). Physicians, social workers and managers were the groups that devoted the most time to rural services; volunteers and students the least. People who worked in local health/mental health agencies devoted the most time to these services; those who worked in advocacy groups the least.

The respondents spent, on the average, 46% of their work time in managing, administering, or planning service or training programs. The second largest block of time was devoted to providing services, for which the sample average was 24%. Fifteen percent (15%) of respondents' work time was spent in teaching, training, or

TABLE VIII

AVERAGE NUMBER OF YEARS WITH CURRENT ORGANIZATION

Participant Characteristic	Number of Respondents	Average Years
Work Role		
Volunteer	15	9.1
Psychiatrist	71	7.2
Teacher	90	6.0
Manager/Administrator	536	5.8
Researcher	78	5.5
Other	179	5.4
Social Worker	254	5.4
Nurse	34	4.8
Psychologist	243	4.7
Physician	15	4.1
Planner	35	3.4
Student	9	2.3
Total Sample	1559	5.5
Organization		
Federal/Washington	31	8.1
University	277	6.9
State Government	159	6.4
Federal/Region	27	5.9
State/Regional Hospital	67	5.9
Private Practice	19	5.6
Advocacy	26	4.9
Other	221	4.9
Health/Mental Health	658	4.8
County/Government	50	4.8
Health Systems Agency	26	3.0
Total Sample	1561	5.5

TABLE IX

PROPORTION OF WORK TIME IN RURAL HEALTH, MENTAL HEALTH, OR HUMAN SERVICES

Proportion of Time	Percentage of Respondents
0-24%	17%
25-49	10
50-74	11
75-100	62
Total	100% (1575)

TABLE X

AVERAGE PERCENTAGE OF WORK TIME SPENT ON HEALTH, MENTAL HEALTH, OR HUMAN SERVICES IN RURAL COMMUNITIES

Participant Characteristic	Number of Respondents	Average Work Time
Work Role		
Physician	14	81%
Social Worker	252	80
Manager	532	78
Psychologist	248	74
Nurse	35	73
Psychiatrist	68	65
Other	176	66
Planner	38	58
Teacher	92	57
Researcher	79	47
Student	10	37
Volunteer	15	28
Total Sample	1559	72%
Organization		
Health/Mental Health	667	84%
Private Practice	16	81
County Government	51	77
State/Regional Hospital	70	75
Other	217	72
State Government	163	64
Health Systems Agency	26	63
Federal/Region	28	63
University	275	50
Federal/Washington	30	48
Advocacy Organization	25	44
Total Sample	1568	72%

clinical supervision; while 8% involved conducting research and/or managing research programs (Table XI).

The professional affiliations of the sample are consistent with the respondents' occupational identification and activities. Thus, 25% of the sample are members of the Mental Health Association, 25% of the National Association of Social Work, and 20% of the American Psychological Association (Table XII).

TABLE XI

MEAN PERCENTAGE OF RESPONDENTS' WORK TIME FOR VARIOUS ACTIVITIES

Work Activity	Mean Percentage[a]	Standard Deviation
Managing/Administering/Planning Service or Training Programs	45.5	22.9
Providing Services	24.0	21.5
Teaching, Training or Clinical Supervision	15.3	12.8
Conducting Research and/or Managing Research Programs	8.0	12.2
Studying (i.e., as a student)	2.0	7.9
Other	5.3	15.9

[a] The analysis is based upon responses from 1,623 respondents.

TABLE XII

DISTRIBUTION OF MEMBERSHIPS IN PROFESSIONAL ASSOCIATIONS (N = 1666)

Professional Association	Percentage[a] of Members
Mental Health Association	25%
National Association of Social Work	25
American Psychological Association	20
Association for Rural Mental Health	18
American Public Health Association	10
Association for Mental Health Administrators	9
American Psychiatric Association	5
American Nurses' Association	4
American Medical Association	3
National Rural Primary Care Association	2

[a] Percentages total more than 100 because individuals have multiple association memberships.

3.0 USE AND VALUE OF INFORMATION SOURCES

Data were collected to identify the topics that respondents sought information about; the sources used to obtain information both in general and with respect to specific topics; and the value that respondents placed on various sources. Associations between topics, sources, and the demographic characteristics of the respondents were analyzed.

While the survey contained some questions that asked respondents to make an overall rating of the value of various sources, most of the data reported in this section result from survey questions that requested data about the respondent's most recent information-seeking episode (ISE). An ISE was defined as an episode of information-seeking behavior that (1) involved obtaining information from outside the respondents' organization; (2) was needed to help solve a substantial problem; and, (3) was related to rural mental health services. Respondents were asked to provide the date of their most recent ISE, the topics they sought advice about at that time, the information sources they used, and the utility of each of these sources.

Requesting participants to focus on a single ISE was expected to yield more detailed and precise answers about their information-seeking behavior than would asking about their information-seeking behavior in general. It is easier to remember one's last trip to the library, and the books that one checked out at that time, than to remember details about one's library usage over the last year. Averaging data about a number of respondents' "last trip" should provide information about library use in general under the assumption that a large number of those surveyed did not have a need for information at the time of the survey that differed from their normal needs.

3.1 General Characteristics of Information-Seeking Behavior

During their last ISEs, the respondents usually asked about several topics and used multiple sources for information. The average ISE encompassed three topics and five sources. The correlation between the number of topics and the number of sources is low ($r = 0.29$), indicating that the number of topics about which information is sought accounts for little (9%) of the variation in the number of sources used.

There were significant but weak correlations between respondents' work role and the number of topics requested ($p \leq 0.02$, $r^2 = 0.02$) and the number of sources used ($p \leq 0.02$, $r^2 = 0.02$) (Table XIII). Volunteers requested information about more topics (5.1) than the other respondents. Physicians asked about the fewest topics (2.4) and used the smallest number of sources (3.0). The largest number of sources was used by nurses (5.4) closely followed by managers (5.2), psychiatrists (5.0), and researchers (5.0).

TABLE XIII

NUMBER OF TOPICS AND SOURCES BY WORK ROLE

Work Role	$\overline{X}$ Topics[a]	$\overline{X}$ Sources[b]
Volunteer	5.1 (12)	4.9 (14)
Nurse	3.8 (31)	5.4 (34)
Psychiatrist	3.6 (57)	5.0 (64)
Manager	3.4 (514)	5.2 (528)
Other	3.3 (168)	4.9 (168)
Student	3.1 (7)	4.7 (9)
Planner	3.1 (35)	4.4 (33)
Teacher	3.1 (77)	4.7 (85)
Researcher	3.1 (71)	5.0 (71)
Social Worker	3.0 (239)	4.6 (246)
Psychologist	2.9 (226)	4.8 (238)
Physician	2.4 (11)	3.0 (10)

[a] $F = 2.02$, $P \leq .02$, $r^2 = .02$

[b] $F = 2.13$, $P \leq .02$, $r^2 = .02$

3.1.1 Topics Requested and Sources Used

The survey listed 14 mental health topics about which information may have been requested. These 14 topics were:

1. Research issues
2. Transportation
3. Government statutes and regulations
4. Recruiting and retaining personnel
5. Stimulating community support
6. Coordination
7. Federal funding
8. Service techniques or protocols
9. Reducing the cost of services
10. Third party reimbursement requirements
11. Education/training
12. Special needs of rural populations
13. Maintaining professional contacts
14. Evaluating the effectiveness of services.

The total number of topics recorded by all respondents in their last ISE was 4,704. The largest number of topic requests was made for information about "the special needs of rural populations" (13.3%). The smallest number of requests was made for information about "reducing the cost of services" (3.1%) (Table XIV).

The association between the topics about which information was sought and the work settings of survey respondents was examined (Table XV). There was a significant ($p \leq .0001$) but low (Phi = 0.24) level of association between work setting and topics requested. Federal staff in Washington deviated most from the interest patterns of the other groups. Washington staff more often wanted information about special rural needs (16.1% of their requests involved this topic, vs. 13.3% for the sample as a whole), evaluating services (11.9% vs. 8.7%), and research issues (12.6% vs. 6.29%). They had less interest in stimulating community support (4.6% vs. 8.7%) and government statutes and regulations (5.7% vs.

TABLE XIV

ISE TOPICS

Topics	Percentage of Topic Requests	$\overline{X}$ Sources
Special Rural Needs	13.3%	5.2%
Coordination	9.4	5.2
Stimulating Community Support	8.7	5.3
Evaluating Services	8.7	5.6
Federal Funding	8.5	5.6
Government Statutes and Regulations	7.6	5.5
Service Techniques/Protocols	6.6	5.1
Research Issues	6.2	5.6
Maintaining Professional Contacts	5.9	5.4
Recruiting/Retaining Personnel	5.1	5.5
Continuing Education	4.9	5.5
Third-Party Reimbursement	4.4	5.8
Transportation	4.0	5.2
Other	3.5	4.9
Reducing Service Costs	3.1	5.7
Total	100.0% (4704)	5.7

TABLE XV

TOPICS BY WORK SETTING

Topics	Local Center	City-County	Hospital	State Government	Federal Regional	Federal Washington	University	Regional National Advocacy	Other	HSA	Private Practice
Special Rural Needs	12.1%	13.0%	13.0%	12.8%	11.9%	16.1%	15.9%	11.7%	13.7%	14.9%	17.3%
Coordination	9.0	12.4	11.7	11.0	8.7	11.5	6.0	9.6	12.1	8.1	9.6
Stimulating Community Support	9.2	11.2	7.8	9.3	7.9	4.6	8.4	7.4	8.1	5.7	7.7
Evaluating Services	8.9	8.3	11.7	8.3	9.5	11.5	8.4	5.3	7.4	12.6	3.8
Federal Funding	8.5	6.5	5.2	8.7	10.3	9.2	10.2	10.6	7.3	10.3	3.9
Government Statutes and Regulations	8.1	10.1	8.6	8.1	10.3	5.7	5.2	9.6	6.7	11.5	9.6
Service Techniques/Protocols	7.3	4.1	8.2	8.5	6.4	3.5	4.7	5.3	6.2	3.5	7.7
Research Issues	4.8	2.4	3.9	4.9	3.2	12.6	13.6	4.3	4.8	5.8	1.9
Maintaining Professional Contacts	5.5	6.5	7.8	4.7	3.2	4.6	7.0	6.4	7.6	1.2	5.8
Recruiting/Retaining Personnel	5.3	5.9	3.5	5.1	9.5	6.9	4.0	8.5	5.4	3.5	1.9
Education/Training	4.4	3.6	5.2	3.3	4.8	4.6	6.7	6.4	5.6	2.3	3.9
Third-Party Reimbursement	5.2	5.3	3.5	5.1	4.8	3.5	2.1	5.3	3.4	5.7	11.5
Transportation	4.2	3.0	3.9	5.1	3.2	2.3	2.7	4.3	5.0	2.3	5.8
Other	3.8	3.0	4.7	2.0	3.2	3.4	3.2	1.0	4.2	5.7	3.8
Reducing Service Costs	3.7	4.7	1.3	3.1	3.2	0.0	1.9	4.3	2.5	6.9	5.8
TOTAL	100.0% (1889)[a]	100.0% (169)	100.0% (231)	100.0% (492)	100.0% (126)	100.0% (87)	100.0% (782)	100.0% (94)	100.0% (644)	100.0% (87)	100.0% (52)

Chi-square = 268.1 DF = 140 p = .0001 Phi = 0.24

[a] The numbers in parentheses represent the number of topics named by respondents in each work setting.

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7.6%); and they made almost no requests for information about reducing costs (vs. 3.1% for the entire sample). Federal regional staff gave more attention than the other groups to recruiting or retaining personnel (9.5% vs. 5.1%). People in private practice made an especially high number of requests about special rural needs (17.3% vs. 13.3%) and third-party reimbursement (11.5% vs. 4.4%) and a low number of requests about research issues (1.9% vs. 6.2%). People at universities made a large number of requests for information about research issues (13.6% vs. 6.2%).

Respondents in various work role categories also sought information about different topics (Table XVI). While the chi-square analysis showed significant differences in the topics requested by respondents in different work roles ($p \leq .0001$), the level of association was low (Phi = 0.27). Respondents who categorized themselves as physicians deviated most from the general pattern of topic requests. A larger percentage of their requests were related to the special needs of rural populations (19.0% vs. 13.3%) and a small percentage to stimulating community support (3.9% vs. 8.7%). Volunteers showed a greater interest in community support than did the entire sample (13.1% vs. 8.7%). Physicians made almost no requests about evaluating services, as opposed to 8.7% of requests from all groups, 11.8% of the requests from researchers, and 10.0% of the requests from planners. Physicians made more requests about government statutes and regulations (15.4% vs. 7.6%) and about transportation (7.7% vs. 4.0%). Volunteers

TABLE XVI

TOPICS REQUESTED BY WORK ROLE

Topics	Physician	Psychiatrist	Psychologist	Nurse	Social Worker	Manager	Researcher	Student	Teacher	Volunteer	Planner	Other
Special Rural Needs	19.0%	12.8%	14.2%	10.3%	15.3%	11.3%	13.2%	18.2%	16.7%	11.5%	15.5%	14.6%
Coordination	11.4	8.4	9.5	12.8	10.3	9.9	6.8	13.6	7.1	3.3	7.3	9.6
Stimulating Community Support	3.9	6.9	9.0	6.0	9.7	9.0	5.0	13.6	9.2	13.1	6.4	8.5
Evaluating Services	[illegible].0	7.9	8.8	7.7	8.6	8.1	11.8	4.6	9.6	9.8	10.0	9.9
Federal Funding	3.9	5.4	7.2	6.8	6.2	10.1	9.1	9.1	8.0	9.8	10.9	9.2
Government Statutes and Regulations	15.4	8.9	5.3	6.0	6.7	9.3	5.0	4.6	5.9	9.8	10.9	6.7
Service Techniques/ Protocols	3.9	4.9	8.2	10.3	9.2	3.8	5.9	4.6	7.1	1.6	4.6	4.8
Research Issues	7.7	5.9	7.8	4.3	4.5	3.7	21.4	13.6	9.2	4.9	5.4	7.6
Maintaining Professional Contacts	7.7	8.9	7.0	3.4	6.6	5.2	7.3	4.5	6.3	4.9	1.8	5.4
Recruiting/Retaining Personnel	3.9	5.9	4.7	4.3	3.7	6.6	3.6	.0	2.9	6.6	5.4	4.5
Continuing Education	3.9	6.9	5.0	9.4	5.5	4.0	1.8	.0	9.6	4.9	2.7	4.5
Third Party Reimbursement	3.9	6.9	4.0	5.1	3.1	5.9	1.8	.0	1.3	3.3	4.6	3.2
Transportation	7.7	3.9	2.6	5.1	4.2	4.7	3.6	4.5	2.5	6.6	1.8	3.9
Other	7.7	3.9	3.8	3.4	4.1	2.6	0.9	9.1	4.2	3.3	7.3	4.7
Reducing Service Costs	.0	2.5	2.9	5.1	2.3	3.8	2.8	.0	0.4	6.6	5.4	2.9
TOTAL	100.0% (26)[a]	100.0% (203)	100.0% (656)	100.0% (117)	100.0% (709)	100.0% (1738)	100.0% (220)	100.0% (22)	100.0% (237)	100.0% (61)	100.0% (110)	100.0% (555)

X^2 = 338.8 DF = 154 $p \leq .0001$ Phi = .27

[a] The number in parentheses represents the number of topics named by each work role type.

(6.6%) and planners (1.8%) made fewer requests about transportation. Physicians (3.9%), along with volunteers (1.6%), made relatively fewer requests about service techniques than was characteristic of the entire sample (6.6%) or of nurses (10.3%). Researchers made more requests about research issues (21.4% vs. 6.2%), while managers devoted a smaller number of their requests (3.7%) to this topic. Physicians were more interested in the topic of transportation (7.7% vs. 4.0%) and made fewer requests related to reducing service costs (0.0% vs. 3.1%). Planners, on the other hand, were less likely to request information on transportation (1.8%) and more likely to seek information on ways of reducing service costs (5.4%).

The total number of sources listed by all respondents was 7,448. The respondents' colleagues, both in and outside their organizations, were the most frequently used sources. The Department of Health and Human Services staff in the Washington or the regional offices were the least used sources (Table XVII - Usefulness and Importance ratings are discussed in Section 3.2). Thus, 17% of the sources listed by respondents were colleagues outside their work unit and 16% were colleagues inside their work unit, while only 4% and 6% were HHS Washington and regional staff, respectively. Since an ISE involved, on the average, 5.7 sources, colleagues outside the work unit were used in 96.9% of the ISE's, colleagues inside the work unit in 91.2%, HHS Washington staff in 22.8%, and HHS regional staff in 34.2%.

TABLE XVII

USE AND MEAN QUALITY RATINGS OF INFORMATION SOURCES

Sources	Percentage of all Sources Used in Last ISE	$\overline{X}$ Usefulness Ratings for Last ISE[a]	$\overline{X}$ General Importance To Work Rating[a]
Colleagues Outside the Work Unit	17%	3.7 (1283)[b]	3.6 (1610)[b]
Colleagues in the Work Unit	16	3.7 (1215)	3.9 (1607)
Conferences/Meetings	13	3.4 (978)	3.4 (1609)
Periodicals	13	3.0 (965)	3.2 (1611)
State Staff	11	3.0 (803)	2.9 (1590)
Research Reports	11	3.0 (794)	2.7 (1565)
Education/Training Courses	9	3.2 (638)	3.2 (1588)
HHS Regional Staff	6	2.9 (439)	2.3 (1569)
HHS Washington Staff	4	2.9 (333)	2.0 (1558)
Total	100% (7448)	2.9 (333)	2.0 (1558)

[a] Rating scores are based on a five-point scale:
1 = No value
2 = Slight value
3 = Moderate value
4 = Great value
5 = Critical value

[b] The numbers in parentheses are the number of respondents who rated each source.

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There is a significant ($p \leq 0.0001$) but weak (Phi = 0.17) relationship between the sources used by respondents and their work setting. Consistent with their interest in research, people who work for the Federal government in Washington or who work at universities indicated that a higher percentage of their sources were research reports than did the sample as a whole (13.4% and 15.0%, respectively, vs. 11%). Advocacy group respondents relied, more than most of the sample, on state staff (16.7% vs. 11%). People in private practice were highly dependent upon colleagues outside their organizations (22% vs. 17%) (Table XVIII).

There is significant ($p \leq .0001$) but weak (Phi = 0.17) differentiation in the choice of sources among the respondents when categorized by work role (Table XIX). Physicians rely on colleagues inside and outside their organization much more than the other groups (27% and 23%, vs. 16% and 17%, respectively) and rarely use periodicals (3% vs. 13%) for their information needs. Researchers use research reports to a greater extent than the sample as a whole (16% vs. 11%). Students and teachers are high in their use of research reports (21% and 14%, respectively, vs. 11%) and periodicals (19% and 16%, respectively, vs. 13%).

A chi-square analysis of the use of each source by the people who asked about specific topics showed only a small associaton (Chi-square = 203.9 DF = 112 $p \leq 0.0001$ Phi = 0.09) between the topics and the sources used. However, there are a few trends worth noting. Some sources had a higher than expected use for a specific

TABLE XVIII

SOURCES BY WORK SETTING

Source	Local Center	City-County	Hospital	State Government	Federal Regional	Federal Washington	University	Regional National Advocacy	Other	HSA	Private Practice
Research Reports	10.2%	8.2%	9.8%	9.1%	6.2%	13.4%	15.0%	6.5%	10.2%	12.4%	8.8%
Periodicals	12.5	12.7	12.4	11.2	8.5	11.0	15.9	11.1	13.3	13.3	14.7
Education/Training	10.0	9.5	9.8	6.8	7.7	3.9	6.6	9.2	8.2	1.8	13.2
Conferences/Meetings	13.4	15.2	13.5	12.7	10.9	9.4	12.1	16.7	13.6	11.5	17.7
State Staff	10.8	13.2	13.2	14.0	11.6	7.1	7.7	16.7	9.1	14.1	5.9
HHS Regional Staff	6.5	3.7	4.5	7.1	12.4	9.4	4.2	3.7	5.5	7.1	2.9
HHS Washington Staff	3.4	2.9	3.4	5.3	10.9	15.0	5.4	4.6	5.2	2.6	2.9
Colleagues in Organization	16.4	17.3	16.7	16.6	17.1	15.8	16.2	13.9	16.0	18.6	11.8
Colleagues Outside Organization	16.8	17.3	16.7	17.2	14.7	15.0	16.9	17.6	18.9	18.6	22.1
TOTAL	100.0% (3258)[a]	100.0% (243)	100.0% (378)	100.0% (737)	100.0% (129)	100.0% (127)	100.0% (1261)	100.0% (108)	100.0% (975)	100.0% (113)	100.0% (68)

Chi-square = 203.9 DF = 80 p = .0001 Phi = .17

[a] The numbers in parentheses represent the number of sources named by respondents in each work setting.

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TABLE XIX

USE OF SOURCES BY WORK ROLE

Sources	Physician	Psychiatrist	Psychologist	Nurse	Social Worker	Manager	Researcher	Student	Teacher	Volunteer	Planner	Other
Research Reports	6.7%	9.1%	11.5%	11.5%	10.2%	9.4%	15.9%	21.4%	14.0%	10.1%	11.0%	11.6%
Periodicals	3.3	14.5	13.3	14.8	13.8	11.4	15.3	19.0	16.0	11.6	12.4	13.4
Education/Training	6.7	10.7	9.5	10.9	10.2	8.4	2.8	9.5	8.5	8.7	2.8	7.8
Conferences/Meetings	6.7	14.1	13.4	13.7	13.8	12.9	12.2	11.9	12.3	14.5	11.7	13.1
State Staff	10.0	8.8	9.5	7.6	8.9	13.1	8.0	4.8	7.0	13.1	13.8	10.4
HHS Regional Staff	10.0	5.7	4.4	4.3	3.8	7.9	5.4	2.4	5.0	2.9	7.6	5.8
HHS Washington Staff	6.7	4.7	3.3	6.0	3.1	4.9	6.8	0.0	5.0	4.4	5.5	5.0
Colleagues in Organization	26.6	15.4	17.6	14.2	17.3	15.7	16.8	14.3	16.7	15.9	18.6	14.9
Colleagues Outside Organization	23.3	17.0	18.6	16.9	18.9	16.3	16.8	16.7	15.5	18.8	16.6	18.0
TOTAL	100.0% (30)	100.0% (318)	100.0% (1150)	100.0% (183)	100.0% (1136)	100.0% (2746)	100.0% (352)	100.0% (42)	100.0% (400)	100.0% (69)	100.0% (165)	100.0% (821)

Chi-square = 169.1 DF = 88 p = 0.0001 Phi = 0.15

topic when compared to the overall sample distribution. These topics and sources most used with respect to these topics are:

1. Research issues--research reports, periodicals
2. Government statutes/regulations--state staff
3. Third-party reimbursement--state staff
4. Continuing education opportunities--education/training courses
5. Federal funding--federal regional staff

3.1.2 Frequency of Information-Seeking

Respondents were asked the date of their last ISE. If the time at which they completed the survey was randomly and uniformly distributed with respect to the time of their last ISE, it can be assumed that the time interval between the ISE and completion of the survey is, on the average, 50% of the time between ISEs. Frequency, defined as the mean number of ISEs per year, can then be computed as 12 (months/year) divided by twice the interval between the reported ISE and the date the survey was completed. For all ISEs, the mean interval between the reported date of the ISE and the date the survey was completed was 4.2 months, indicating a mean frequency of 1.4 ISEs per year. The frequencies ranged from 1.1 ISEs per year for ISEs that included transportation as a topic to 1.9 per year for ISEs that included coordination (Table XX).

3.2 Quality Ratings of Information Sources

The respondents rated the value of the information sources that they used during their last ISE. They also rated the general

TABLE XX

FREQUENCY OF ISE'S ADDRESSING SPECIFIC TOPICS

Topic	Frequency (Number/Year)
Tranportation	1.1 (177)*
Special Rural Needs	1.3 (599)
Other	1.4 (151)
Service Techniques	1.5 (301)
Continuing Education	1.5 (215)
Evaluation Services	1.5 (390)
Research Issues	1.5 (277)
Maintaining Professional Contacts	1.6 (272)
Stimulating Community Support	1.6 (400)
Government Statutes and Regulations	1.6 (338)
Third-Party Reimbursement	1.6 (196)
Federal Funding	1.7 (381)
Reducing Service Costs	1.8 (139)
Recruiting/Retaining Personnel	1.8 (233)
Coordination	1.9 (428)

*Numbers in parentheses are the number of ISEs that included this topic.

usefulness of each source in their work. The most used sources (i.e., colleagues, conferences) were more likely to be highly rated than the least used sources. The ratings for the sources in general and for their value in the ISE were similar. The ISE ratings and the general importance ratings are shown in Table XVII.

3.2.1 Source Ratings by Work Role and Work Setting

The value ratings of sources made by respondents in different work roles were compared using analysis of variance. Although the ratings for each source varied significantly among work role types, the level of association was always low. Table XXI shows which group found each source most valuable and which group least valuable. Physicians were distinctive in their low ratings for many of the sources. Research reports and HHS Washington staff were most valued by researchers. Periodicals were valued most by teachers and education courses by nurses. Planners gave the highest rating to HHS regional staff. Conferences, state staff, and colleagues outside the organization were most valued by volunteers. Colleagues in the organization were most valued by students.

The average value ratings given each ISE source by respondents in different types of work settings were compared. The highest and lowest rating for each source is presented in Table XXII. Federal employees, regional or Washington based, gave the highest ratings to all but three of the sources: periodicals, education, and colleagues outside the organization. People in private practice gave the lowest ratings to governmental sources of information.

TABLE XXI

SOURCE RATINGS BY WORK ROLE GROUPS

Source	Highest Rating	Lowest Rating
Research Reports	Researcher 3.6	Physician 2.5
Periodicals	Teacher 3.7	Volunteer 2.6
Education Courses	Nurse 3.8	Volunteer 2.5
Conferences/Meetings	Volunteer 3.7	Physician 3.0
State Staff	Volunteer 3.8	Physician 1.7
HHS Regional Staff	Planner 3.8	Physician 1.7
HHS Washington Staff	Researcher 3.8	Physician 1.5
Colleagues in Organization	Student 4.3	Planner 3.4
Colleagues outside Organization	Volunteer 3.9	Psychiatrist 3.4

TABLE XXII

SOURCE RATINGS BY WORK SETTING GROUPS

Source	Highest Rating	Lowest Rating
Research Reports	Federal Region 3.9	Advocacy Group 2.3
Periodicals	University 3.4	HSA 2.5
Education	HSA 3.5	Advocacy Group 2.9
Conferences	Federal Washington 4.0	Hospitals 3.2
State Staff	Federal Region 3.7	Private Practice 1.8
HHS Region	Federal Region 4.1	Private Practice 2.0
HHS Washington	Federal Washington 3.7	Private Practice 1.5
Colleagues in Organization	Federal Washington 4.0	HSA 3.3
Colleagues outside Organization	Advocacy Group 4.0	Hospital 3.5

3.2.2 Source Ratings By Topic Category

The value of the sources with respect to specific topics was analyzed by comparing the mean rating assigned to a source by those people whose ISE included a specific topic with the mean rating assigned by people who had used the source but not for information about the topic in question. T-tests were used to determine whether or not the two groups differed significantly ($p \leq .01$ or less). Only 32 of 135 comparisons were significant. Research reports and periodicals had a limited application; they were highly rated only by those respondents who asked about research issues. Colleagues outside the respondents' organizations had the broadest use. Respondents who asked about 10 of the 14 topics rated colleagues outside the organization significantly higher than the respondents who did not ask about those 10 topics (Table XXIII). This may reflect the generally high rating given to this source combined with its being of lesser value for the remaining four topics (i.e., transportation, government statutes and regulations, federal funding, and recruitment and retention of personnel).

3.3 Summary of Findings

Findings presented in the preceeding Sections indicate that individuals working as researchers, policy makers or practitioners in rural mental health seldom seek information from outside their own organization to help solve a problem related to rural mental health. Such Information Seeking Episodes (ISEs) occur, on the average 1.4 times per year (i.e., once every 8.4 months). Assuming

TABLE XXIII

SOURCE RATINGS BY TOPICS

Source and Sample $\overline{X}$ Rating	Topics	$\overline{X}$ Rating	P
Research Reports 3.0	• Research Issues	3.4	.0001
	• Third-Party Reimbursement	2.7[a]	.004
Periodicals 3.0	• Research Issues	3.4	.0001
	• Third-Party Reimbursement	2.8[a]	.002
Education-Training Courses 3.2	• Opportunities for Continued Education	3.6	.0001
	• Service Techniques and Protocols	3.5	.002
State Staff 3.0	• Government Statutes and Regulations	3.2	.006
	• Coordination	3.2	.001
HHS Regional Staff 2.9	• Government Statutes and Regulations	3.1	.01
	• Federal Funding	3.1	.0003
HHS Washington Staff 2.9	• Research Issues	3.4	.0001
	• Federal Funding	3.2	.002
Conferences/ Meetings 3.4	• Maintaining Coordination	3.6	.0002
	• Professional Contacts	3.6	.0003
	• Opportunities for Continued Education	3.6	.0008
	• Recruiting-Retaining Personnel	3.6	.003
	• Special Rural Needs	3.5	.0005
Colleagues in Organization 3.7	• Maintaining Professional Contacts	4.0	.0001
	• Reducing Service Costs	4.0	.005
	• Coordination	3.9	.0001
	• Service Techniques and Protocols	3.9	.001
	• Third-Party Reimbursement	3.9	.01
Colleagues Outside Organization 3.7	• Reducing Service Costs	4.1	.0001
	• Service Techniques and Protocols	4.0	.0001
	• Maintaining Professional Contacts	4.0	.0001
	• Third-Party Reimbursement	4.0	.0001
	• Coordination	3.9	.0001
	• Stimulating Community Support	3.9	.0001
	• Research Issues	3.9	.001
	• Special Needs of Rural Populations	3.9	.001
	• Opportunities for Continuing Education	3.9	.003
	• Services Evaluation	3.9	.009

[a] These $\overline{X}$ ratings are significantly lower when compared to all other topics. All other topic means are significantly higher.

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that information is required more frequently than this, human service workers tend to obtain the information that they need from within their own organization.

Despite the fact that respondents were reporting on ISEs that involved going outside their organization for information, 91% of the ISEs included seeking information from colleagues within the respondent's work unit--emphasizing the importance of intraorganizational person-to-person communication. The importance of both inter- and intraorganizational person-to-person communication is further emphasized by the fact that colleagues outside the work unit were involved in 97% of the ISEs, as opposed to research reports being used in 63% and periodicals in 74% of the ISEs.

Significant relationships were observed between the use or value of various information sources and the respondent's work role, work setting, or the topics about which information was sought. All of these relationships were, however, weak. Researchers, respondents who work at universities, and individuals seeking information about research issues tended to use and value research reports more than other respondents. Physicians tended to give lower ratings to the value of most information sources, but relied more on colleagues as sources of information, than did other respondents.

Most ISEs were broadly focused--the average ISE sought information about 3 topics and used 5 sources. The survey respondents thus do not appear to seek information about narrow, discrete topics. These findings, combined with the high use and value of informal contacts with colleagues and attendance at conferences or meetings, suggest that the occurrence of an ISE may be triggered, and the scope of information sought in the ISE influenced, by the availability of information. A discussion with a colleague, or attendance at a conference, can both suggest information needs and re-direct the information recipient's ideas about the scope of information needed (e.g., by providing awareness of alternative approaches to solving a problem).

The survey findings thus confirm findings reported in the Background section of this paper for a field that includes researchers, policy makers, and practitioners. Thus: Information is often obtained from within the organization; person-to-person communication is extremely important; differences are observed in the sources of information used, and the value placed on these sources, by individuals in different work rules and settings; and information seeking behavior usually does not focus on finding a specific piece of technical data to answer a specific and narrowly defined question.

4.0 INFORMATION EXCHANGE AMONG INDIVIDUALS

The previous analyses show the importance of contact with other people to persons seeking information. In this section, the exchange between people is analyzed more closely. These analyses are based on the respondents' reports of their contacts with people named on the survey and with others, whom they listed on the survey form as people outside their organizations from whom they had sought advise during the year prior to the survey. The latter group will be referred to as the "volunteer name list" and the former as the "survey name list". Analyses of the extent to which individuals initiate or receive contacts are presented, followed by analyses of the network of linkages among individuals.

4.1 Contact Initiators and Receivers

Seventy-seven percent (1,277) of the sample reported that they had asked one or more people outside their own organization for advice or information about a substantial issue related to rural mental health in the year preceeding the survey. Respondents reported that they had, in total, contacted 5,644 individuals (one or more times each). Many of these individuals were named by more than one respondent--2,861 separate individuals who had acted as a source of information were identified. The average contact initiator contacted four individuals in the last year. Table XXIV shows the distribution of the respondents by the number of people they had contacted.

TABLE XXIV

DISTRIBUTION OF RESPONDENTS BY THE NUMBER OF INDIVIDUALS CONTACTED

Number of Individuals Contacted	Percentage of Respondents
0	23
1	14
2	12
3	10
4	8
5	14
6-10	13
11-20	4
21-51	1
	99% (1666)

Of the total number of contacts, 2,296 were made to people on the survey name list. As shown on Table XXV, less than half of the respondents indicated any contacts with the people listed on the survey.

Respondents volunteered the names of 2,681 separate individuals, with whom they had made a total of 3,348 contacts. The distribution of the sample by the number of person-contacts with the volunteer name list is shown on Table XXVI.

The respondents were asked to state the number of separate times they requested advice from each individual they contacted. They gave this information for 5,203 of their contacts. One-fifth (20%) of the respondent-contacts involved only one request for information during the year; 9% involved more than 16 requests (Table XXVII). On the average, a respondent requested advice from an individual whom he or she identified as a source of information 6.2 times during the past year. This mean is potentially inflated by 213 responses indicating that communication with a specific individual occurred more than 30 times within the year. The median number of requests from a respondent to an individual who served as a source of information was three.

Overall, the distribution of information requests to individuals with respect to topic (Table XVIII) was similar to that reported with respect to the respondents' last ISE. Somewhat more of the topics requested in the respondents' last ISE were related to

TABLE XXV

DISTRIBUTION OF RESPONDENTS BY NUMBER OF SURVEY LIST CONTACTS

Number of Individuals Contacted	Percentage of Respondents
0	57%
1-2	27
3-5	10
6-10	4
11-19	1
20-51	1
	100% (1666)

TABLE XXVI

DISTRIBUTION OF RESPONDENTS BY NUMBER OF VOLUNTEER NAME LIST CONTACTS

Number of Individuals Contacted	Percentage of Respondents
0	36%
1	13
2	13
3	10
4	8
5	19
	100% (1666)

TABLE XXVII

NUMBER OF SEPARATE REQUESTS REPORTED DURING THE LAST YEAR TO INDIVIDUALS IDENTIFIED AS INFORMATION SOURCES

Number of Requests/Year	Number of Occurrences	Percent Occurrences
1	1018	20
2	1017	19
3-4	1129	22
5-9	908	17
10-15	683	13
16-34[a]	448	9

[a] 147 responses (3%) indicated 34 or more contacts with a specific individual during the year preceeding the survey. These responses were coded as 34.

TABLE XXVIII

PERCENT OF TOPICS REQUESTED IN LAST ISE AND FROM INDIVIDUALS

Issues	Percentage in ISE*	Percentage in Requests to Persons		
		All Names	Names on Survey	Names Volunteered by Respondents
Special Rural Needs	13%	11%	12%	10%
Coordination	9	10	10	10
Stimulating Community Support	9	7	5	9
Evaluating Services	9	6	6	7
Federal Funding	9	11	14	7
Government Statutes and Regulations	8	11	12	9
Service Techniques/Protocols	7	6	3	8
Research Issues	6	8	9	7
Maintaining Professional Contacts	6	8	9	7
Recruiting/Retaining Personnel	5	5	4	6
Continuing Education	5	11	12	10
Third-party Reimbursement	4	2	2	3
Transportation	4	2	1	2
Reducing Costs	3	2	1	2

*From Table XIV - "other" category omitted. Percentages may not total 100 due to rounding.

evaluating services (9%) than was the case when individuals were contacted (6%). Somewhat fewer of the ISE topics related to government statutes and regulations (8% vs. 11%) or to opportunities for continuing education (5% vs. 11%). The survey name list individuals were more likely to be asked about federal funding (14%) or government statutes and regulations (12%) than were volunteer name list individuals (7% and 9%, respectively). Volunteer name list individuals, on the other hand, were more likely to be asked about stimulating community support (9%) or service techniques (8%) than were name list individuals (5% and 3%, respectively). The differences between the distribution of topic requests to survey and volunteer name list individuals might be expected, since most key federal officials were on the survey name list.

One hundred and eighty (180) out of the 197 survey list names (with made up names eliminated) received at least one contact. By definition, all 2,681 names volunteered as sources of information by survey respondents received at least one contact. Each person named as an information source was contacted, on the average, by 1.9 respondents. The average number of contacts for each survey name list individual was 12.8. Each volunteer name list individual averaged 1.2 contacts. Table XXIX shows the difference between these two categories in the number of their contacts. It is interesting to note that 80% of the individuals who provided information provided it to only one survey respondent. Ninety percent of these individuals provided information to two or fewer respondents.

TABLE XXIX

NUMBER OF INDIVIDUALS CONTACTED BY ONE OR MORE RESPONDENTS

Number of Respondents Contacting an Individual	Name List Individuals Receiving this Many Contacts		Volunteered Individuals Receiving This Many Contacts		All Identified Information Providers Receiving Contacts	
	Number	Percent	Number	Percent	Number	Percent
0	17	8.6%	N/A[a]	N/A	N/A	N/A
1	23	11.7	2276	84.9%	2299	80.4%
2	11	5.6	268	10.0	279	9.8
3	15	7.6	82	3.1	97	3.4
4	8	4.1	26	1.0	34	1.2
5	14	7.1	14	0.5	28	1.0
6-7	15	7.6	10	0.4	25	0.9
8-9	15	7.6	3	0.1	18	0.6
10-12	13	6.6	1	0.0	14	0.5
13-16	15	7.6	1	0.0	16	0.6
17-30	32	16.2			32	1.1
31-99	19	9.7			19	0.7
	197	100.0[b]	2681	100.0	2861	100.0

[a] N/A - Not Applicable.

[b] Note - Total percentages may not equal 100 due to rounding.

The number of persons providing information to n survey respondents is approximately proportional to $1/n^3$. More exactly:

$$\text{Number of persons receiving n contacts} = 2298.5516/n^{3.0022}, \text{ with } r^2 = 0.9999,\ p \leq 0.00005.$$

The respondents' contacts with subgroups of individuals in the survey name list were examined by assigning each of the 200 names to one of five groups. The following five groups were used:

1. Individuals who have positions of importance and visibility (e.g., directors of associations, federal officials)
2. Individuals who were recommended to the MITRE staff as experts in rural mental health
3. Randomly selected participants in an annual meeting of the Rural Mental Health Association
4. Authors of books and articles that had potential relevance to rural mental health services
5. Made-up names

When a survey name list individual belonged to more than one category, MITRE staff made a subjective judgement about the most appropriate category to use. The individuals who were placed on the survey name list because of their organizational position (n=77) received the most contacts (18.6 each), followed by individuals who had been identified as experts (n=65) in various areas of rural mental health (9.7 contacts). Individuals who were selected at random from among meeting participants (n=30) received more contacts (4.7) than authors (n=25, 3.7 contacts) or made-up names (n=3, 3.3 contacts) (Table XXX).

TABLE XXX

REPORTED CONTACTS WITH SUBGROUPS OF SURVEY NAME LIST

Subgroups of Names Listed on Survey	Mean Number of Individuals Contacting Survey Name List
Individuals who hold "visible" rural mental health positions (n=77)	18.6
Rural mental health experts (n=65)	9.7
Randomly selected participants annual meeting of the Rural Mental Health Association (n=30)	4.7
Authors of potentially relevant books and articles (n=25)	3.7
Made-up names	3.3

4.2 Person-to-Person Communication Networks

As indicated previously, participants placed a high value on person-to-person contacts for helping them solve problems related to rural mental health. Over ninety percent (90%) of all survey respondents reported that their last information-seeking episode (ISE) involved contacts with persons outside of the respondents' work unit. Fifty-four percent (54%) of all the sources employed in this ISE were person-to-person contacts, with another 22% representing conferences or courses. Contact with colleagues outside and inside the respondents' work unit were the two most highly rated sources of information--both in general and with respect to the individual's last information-seeking episode.

This section describes additional analyses of the person-to-person communication network. These analyses involved consideration of four network characteristics:

- Connectedness: measuring the extent to which people are linked together through the informal communication network. A completely connected network is one in which each individual is connected directly to every other individual.

- Centrality: describing how individuals are linked together. A given level of connectedness could be obtained either by having individuals linked together through long chains of indirect contacts (showing a low degree of centrality) or, on the other hand, by having many individuals linked to a few individuals, who serve as "nodes" in the network.

- Homogeneity: addressing the questions of who is linked together. If the network exhibits discrete clusters of individuals (i.e., groups of individuals who are more likely to be linked to each other than to other members of the network), are the clusters homogeneous with respect to work setting, work role, etc.? If the network shows a small number of clusters, are those individuals who are linked to each other directly likely to have more characteristics in common than those who are not so linked?

- Differentiation: describing whether specialization with respect to topic area occurs in the network. Are individuals recognized as experts with respect to a single topic or a small number of topics, on the one hand, or do the people who provide information to others tend to provide it about a wide variety of topics?

4.2.1 Connectedness

Connectedness is assessed in two ways. First, a quantitative measure of the "total" connectedness is obtained by comparing the total number of links reported between different individuals with the total number of possible links that might be formed.

Second, connectedness is measured by determining the number of individuals who are linked together either directly or through indirect chains of contact (i.e., individuals A and C are said to be linked if A is linked to B and B is linked to C--even if A and C do not communicate directly). This analysis of indirect connections measures the extent to which the network can transfer information under ideal circumstances. It shows how many people can receive information that is transmitted to one person in the network, under the assumption that each person communicates the information to his or her contacts. The number of discrete clusters (or sub-networks in which individuals communicate with only the individuals in their own sub-network) determines the number of people (i.e., one in each cluster) that must be given information if it is to be transmitted to everyone in the network. These analyses also allow comparison of the extent to which individuals are linked together in the field of rural mental health with such linkages in basic science disciplines [e.g., 78% of researchers in an area of mathematics, 74% in rural sociology (Crane 1972), and 73% in sleep and dream research (Crawford 1970) were directly or indirectly linked through informal communication].

Analyses of the contacts initiated by survey respondents and the contacts received by persons who provided information indicate that the communication network might be fragmented. The potential fragmentation of the network is made most apparent by the fact that 2,299 (80%) of the 2,861 individuals who were identified as sources of information by survey respondents were identified by only one respondent.

The person-to-person communications reported by survey respondents involved 3,679 discrete individuals, each of whom participated in one or more communication links as an information seeker, information provider, or both. The number of possible links (disregarding the direction of the contact) among these 3,679 individuals is calculated as the number of separate pairs that can be taken from the sample of 3,679 or, representing the total number of individuals as N, as $N!/2!(N-2)!$. This represents 6,765,681 possible links. The 1,666 survey respondents reported a total of 5,644 contacts among 3,679 separate individuals. One hundred and fifty-six (156) of these contacts (2.8%) were two-way communications among survey repondents, leaving 5,488 unique links (or pairs of individuals). The probability that a randomly chosen pair of individuals communicates is thus 5,488/6,765,681, or .00081.

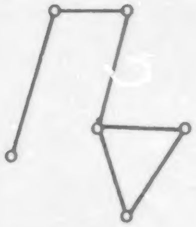
This probability can be adjusted to account for the facts that surveys were not received from a large number of the individuals who participated in communication links, and that only interorganizational links were reported, possibly resulting in an artificially deflated value for the probability of contact. Respondents indicated that they made, on the average, 3.4 contacts with individuals outside their work unit. If we assume that this figure is representative of those individuals from whom surveys were not received, and that all contacts were among the 3,679 individuals who participated in communication links (i.e., no new individuals are added to the network), then 12,509 links would have been reported. Further, a random sample of 60 people from the list of individuals who received the survey indicated that, on the average, there were 1.5 survey respondents in each organizational unit. Multiplying the 12,509 links by 1.5 yields 18,764 potential links, or .28% of the total possible number. A high estimate of the probability of contact between two individuals is, therefore, .0028.

The degree of connectedness was also measured by determining the number of individuals who were linked together either directly or indirectly. A 3,679 by 3,679 matrix was formed to represent the links among the 3,679 individuals who participated in communication links. Elements of the matrix for which a contact occurred between the individuals denoted by a row-column intersection, along with diagonal elements, were set to one. Elements that did not represent a contact were set to zero. The matrix was collapsed by iteratively combining all rows that shared a one in any column. Each non-zero row of this transformed matrix denoted a discrete group of individuals who were linked, directly or indirectly, to each other but were not linked to any other individuals.

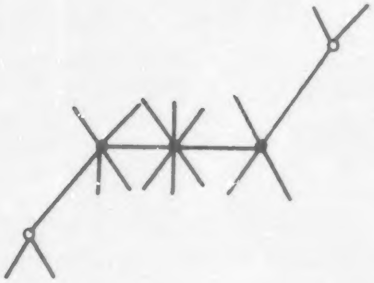
Two hundred and forty-nine separate groups of individuals were identified by this procedure. One of these groups contained 2,627 individuals out of the 3,679 (71.4%) who were involved in reported person-to-person communication. Nine groups contained between 10 and 21 individuals each. These groups included a total of 121 individuals, representing 3.3% of the total sample. The remainder of the individuals (949 or 25.8%) were in groups that contained between two and nine individuals each. Thus, a large number of the individuals engaged in rural mental health (71.4%) are linked together directly or indirectly, despite the apparent fragmentation of the network when viewed in terms of direct linkages.

4.2.2 Centrality

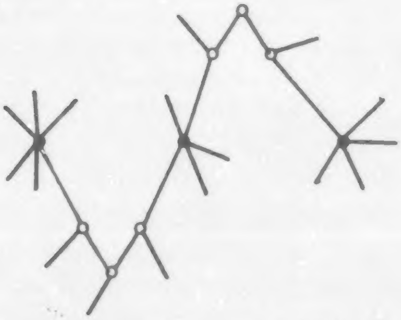
Several different network configurations could account for how this large number of individuals (71.4%) are linked together despite the overall sparseness of links among individuals. As indicated in Figure 1, the indirect linkage might be due primarily to links formed between "random" individuals, resulting in a large number of individuals linked together through chains of associations. Alternatively, there could be a relatively small number of "nodal"



Links Between Random Individuals



Links Between Nodal Individuals



Links Between Peripheral Individuals

FIGURE 1
POTENTIAL MECHANISMS FOR INDIRECT LINKAGE

individuals, each of whom is linked to a large number of others. If nodal individuals exist, the observed linkage may result either from a high degree of linkage between these individuals or from links among individuals at the periphery of the clusters surrounding each nodal individual.

Previously described analyses showed that nodal individuals exist--19 out of the 2,861 people who were identified as sources of information (0.7%) received from 30-100 requests each as compared with the 1.9 requests received, on the average, by all information providers.

Ten nodal individuals, those survey respondents who had received requests for information from the greatest number of people, were selected for more in-depth analysis of their links. Each of these individuals received, on the average, requests for information from 51.2 others and, in addition, themselves contacted 18.2 persons for information.

A high degree of communication was observed within the group of nodal individuals. Of the 182 links that they reported initiating, 29 (15.9%) were to another member of this core group. Each, therefore, was linked, on the average, to 2.9 of the other 10 nodal individuals. The probability that two randomly selected nodal individuals were linked is .29--a number that is 358 times greater than the probability (0.00081) of a link occurring between two randomly selected individuals.

Nine of the nodal individuals were linked together through direct or indirect communications within the group. There were 28 reported communications among these nine people, seven of which were reported by both parties. The 21 (28-7) links formed among the nine individuals represent 58.3% of the possible 36 links.

The tenth person made no contacts with, nor was he contacted by any of the other nine nodal individuals. He sought information from two persons outside the nodal group, engaged in two-way communication with one other person, and was listed as a source of information by 41 additional survey respondents. He was thus directly linked to 44 persons outside the nodal groups. Nineteen of the 42 individuals (45.2%) who contacted this individual also contacted one or more of the other nodal individuals for information (On the average, each of these 19 individuals contacted 2.3 additional nodal individuals). He was thus indirectly linked to the other nine nodal individuals through 19 persons outside the nodal group.

Three hundred and sixty-seven people engaged in information exchange with the nodal individuals as diagrammed in Figure 2. Thirty-six people (Group A) both sought information from and provided information to members of the nodal group. Two hundred and seventy-two people (Group B) sought information from individuals in the nodal group. Fifty-nine individuals were contacted for information by one or more individuals in the nodal group. The 10 individuals in the nodal group were linked to 367 separate

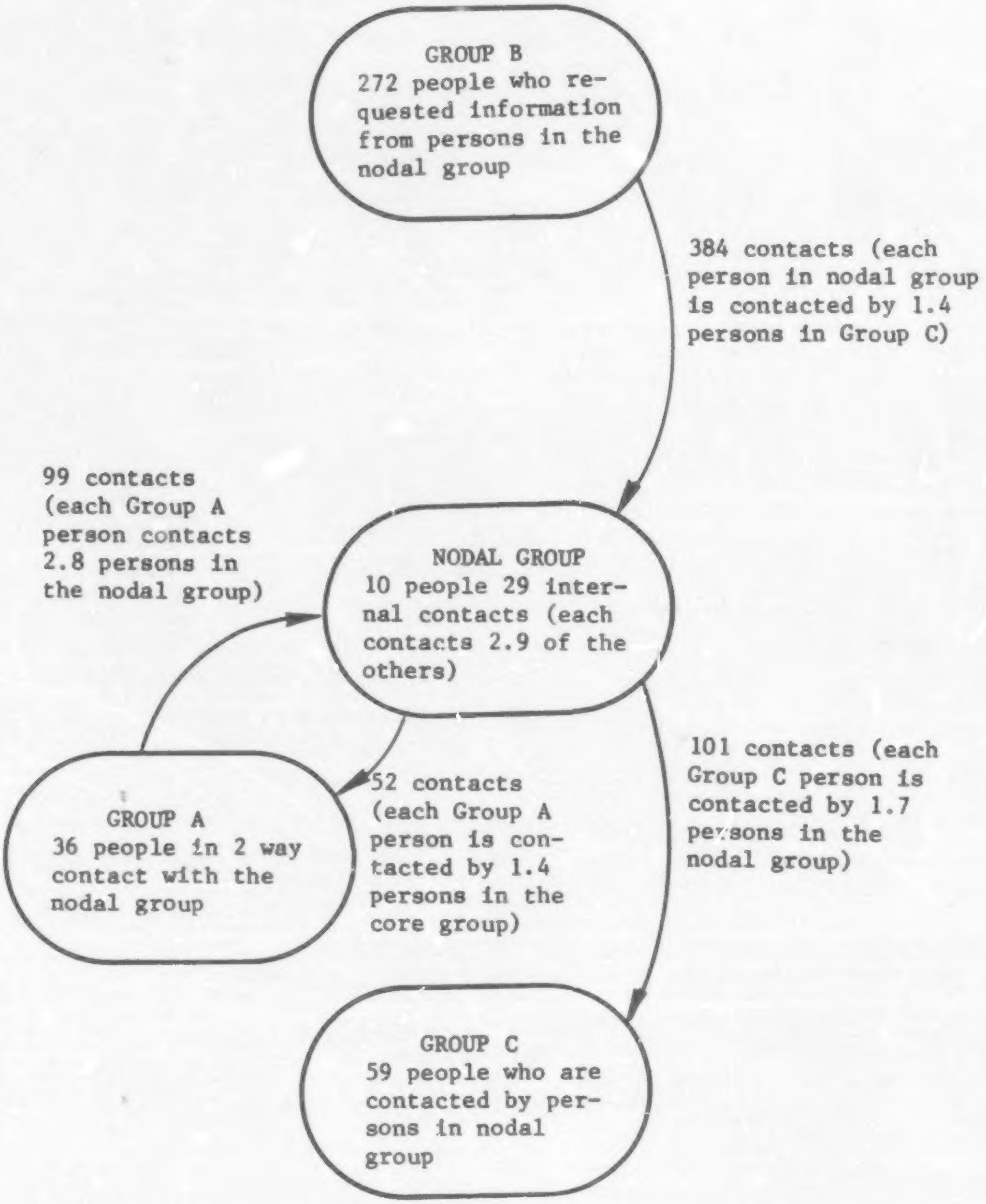

GROUP B
272 people who requested information from persons in the nodal group
384 contacts (each person in nodal group is contacted by 1.4 persons in Group C)
99 contacts (each Group A person contacts 2.8 persons in the nodal group)
NODAL GROUP
10 people 29 internal contacts (each contacts 2.9 of the others)
101 contacts (each Group C person is contacted by 1.7 persons in the nodal group)
52 contacts (each Group A person is contacted by 1.4 persons in the core group)
GROUP A
36 people in 2 way contact with the nodal group
GROUP C
59 people who are contacted by persons in nodal group

FIGURE 2
LINKS WITH NODAL GROUP INDIVIDUALS

individuals, forming a cluster of 377 linked individuals. The observed cluster, containing 2,627 individuals (71.4% of all people who participated in person-to-person communication), would be explained if each of the 267 individuals in groups A, B, and C (Figure 2) is linked to three individuals outside any of the groups identified (801 new individuals) and if each of these individuals is, in turn, linked to two other "new" individuals (1,602 new individuals). The total number of persons linked together would thus be 2,680 (10 + 267 + 801 + 1,602), even if no linkages occurred among individuals at the periphery of the cluster. This configuration is diagrammed in Figure 3.

The network diagrammed in Figure 3 links each individual in a cluster of 2,680 individuals to a nodal person through a chain of not more than two other people. Such a network could, theoretically, provide for efficient information transfer--particularly when compared with network configurations that would require information to be transferred through longer chains of contact. There is, however, a great possibility that the network's actual effectiveness is much less than its potential effectiveness, since the failure of any one individual (particularly a nodal individual) to transmit information will have a major impact--the network, as diagrammed, has no redundancy, or alternate paths.

While the interconnections of individuals in the 1st, 2nd, and 3rd levels, as depicted in Figure 3, have not been analyzed, it is

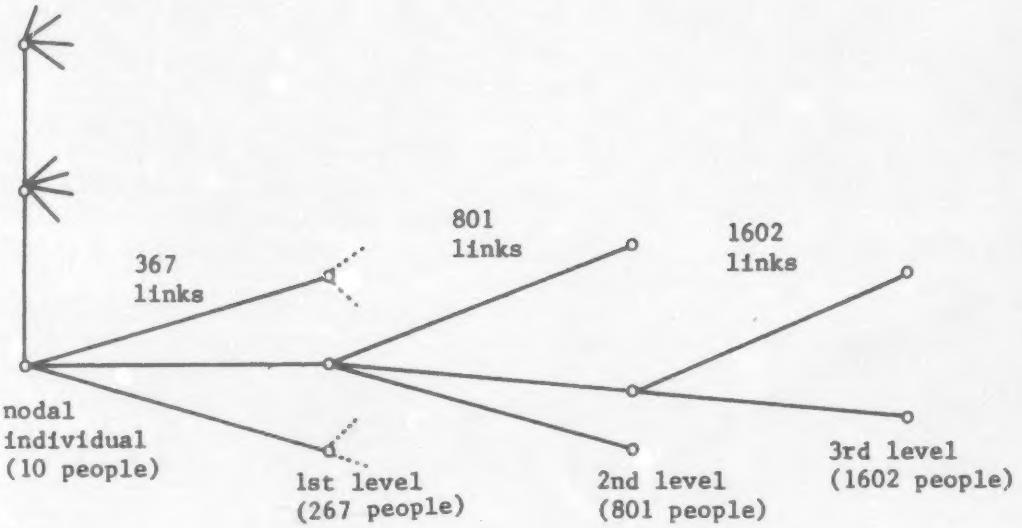


FIGURE 3
MINIMUM POTENTIAL NETWORK STRUCTURE

evident that some redundancy does exist. As shown in Figure 2, persons in groups A and B tend to contact more than one nodal individual when seeking information. Similarly, more than one individual in the nodal group contacts individuals in groups A and C.

It is possible to estimate the degree of redundancy in the network. We might assume that 71%, or 3,896 of the 5,488 links reported by all survey respondents occurred among the single cluster of 2,627 individuals (who represent 71% of the identified individuals). According to the structure diagrammed in Figure 3, these individuals could be connected through 2,627 links. The 3,896 reported links are 1,269 (or 48%) more than the 2,627 links that are required to connect the individuals. An example of the potential network structure with redundant links is diagrammed in Figure 4.

The "redundancy factor" of 48% is consistent with the links diagrammed in Figure 2. As indicated in that Figure, the 331 individuals in groups B and C have 485 links with individuals in the nodal group--an excess of 154 links (or 47%) over the 331 links that would be required to connect the group B and C individuals to members of the nodal group.

4.2.3 Homogeneity

This section presents data on the effect of the respondents' work roles, work setting and geographic locations on their person-to-person contacts. The following analyses are based on 988 dyads, each composed of a contact initiator/contact receiver pair both of whom were survey respondents. The patterns of

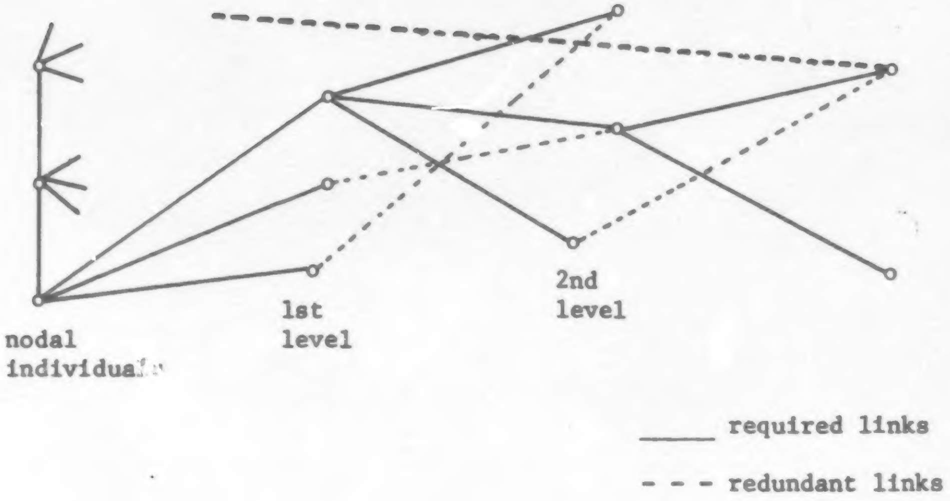


FIGURE 4
POTENTIAL NETWORK STRUCTURE WITH REDUNDANCY

information exchange for subgroups of respondents were examined by expressing the observed extent of communication between pairs of subgroups as a percentage of the magnitude of communication that would be expected if the communication links were random. (Chi-square tests were not performed for this data because more than 5% of the cells have expected values of less than five, making the test unreliable).

For the variable of work role description, the observed contacts among a subset of the 988 dyads (n=540) that included psychologists, social workers, managers or administrators, and researchers were tabulated (Table XXXI). The ratio of observed to expected communication was greater within a subgroup than between subgroups for all of the professional subgroups. Thus, for example, psychologists communicate with other pscyhologists 8.4 times as frequently (844%) as expected; social workers with social workers 1.8 times as frequently, etc.

For the variable of work organization, the observed contacts were tabulated for individuals who worked at a health facility, federal government regional office, federal government Washington, D.C. office or universities (613 dyads). Generally, the percentage of expected communications that occurred was greater within a subgroup than between subgroups (Table XXXII). The one exception was that respondents located in HEW regional offices tended to contact HEW staff in Washington, D.C. to a greater extent than they contacted individuals working in other regional offices.

TABLE XXXI

PERCENTAGE OF EXPECTED COMMUNICATION AMONG RESPONDENTS CLASSIFIED BY WORK ROLE

CONTACT INITIATORS	CONTACT RECEIVERS			
	Psychologist	Social Worker	Manager/ Administrator	Researcher
Pscyhologist	844% (18)[a]	110% (2)	22% (4)	0% (0)
Social Worker	31 (2)	183 (10)	99 (54)	107 (6)
Manager/Administrator	65 (23)	86 (26)	107 (322)	81 (25)
Researcher	117 (5)	82 (3)	80 (29)	295 (11)

[a] The observed cell frequencies are in parentheses.

TABLE XXXII

PERCENTAGE OF EXPECTED COMMUNICATION AMONG RESPONDENTS CLASSIFIED BY WORK ORGANIZATION[a]

	Contact Receivers			
Contact Initiators	Local Health or Mental Health Facility	Federal Regional Office	Federal Gov't Wash. D.C.	University
Local Health or Mental Health Facility	146% (133)	94% (66)	49% (28)	93% (108)
Federal Regional Office	59% (10)	176% (23)	188% (20)	42% (9)
Federal Gov't Wash. D.C.	27% (5)	126% (18)	232% (27)	77% (18)
University	47% (19)	71% (22)	118% (30)	150% (77)

[a] The observed cell frequencies are in parentheses.

The influence of geographic location upon information exchange was examined by classifying the initiator and receiver of the information request by their geographic location (Table XXXIII last two rows). The communication patterns across states revealed that information exchanges were more likely to occur for individuals who were within the same state than for individuals located in different states. The observed information exchange among survey respondents who worked in the same state was 16.54 times greater than the expected number of information exchanges. The observed information exchanges among survey respondents who worked in different states was .64 times the number of information exchanges that were expected. This finding of information exchanges being more likely to occur within similar geographic areas was replicated when the information exchanges were classifed by the survey respondents' DHHS geographic region.

For various groupings of respondents, there was evidence that the percentage of expected communications that occurred was greater within a subgroup than between subgroups for the variables of professional title and type of work organization. Upon considering all categories (988 dyads) of the variables of professional title, type of work organization, geographic region and state, even stronger evidence was found for the greater percentage of expected communications that occurred within each similar subgroup than between different subgroups (Table XXXIII).

TABLE XXXIII

PERCENTAGE OF EXPECTED COMMUNICATION AMONG RESPONDENTS WITHIN SIMILAR GROUPS AND BETWEEN DIFFERENT GROUPS

Grouping Variable	Within a Similar Group	Between Different Groups
Professional Title	466% (404)[a]	63% (550)
Type of Work Organization	342 (272)	78 (682)
DHHS Region	556 (569)	49 (455)
State	1654 (385)	64 (639)

[a] The observed cell frequencies are in parentheses.

4.2.4 Differentiation

The extent of differentiation among individuals contacted for information on rural mental health was analyzed by identifying "resource people" who provide information on rural mental health and determining whether these people are asked about few or many topics. To examine the degree of differentiation among resource people, a subgroup of the survey name list individuals who had received contacts from six or more people (N=108) was identified. As noted previously, the survey listed 14 mental health issues about which a person may have been contacted. These included:

1. Research issues
2. Transportation
3. Government statutes and regulations
4. Recruiting and retaining personnel
5. Stimulating community support
6. Coordination
7. Federal funding
8. Service techniques or protocols
9. Reducing the cost of services
10. Third party reimbursement requirements
11. Education/training
12. Special needs of rural populations
13. Maintaining professional contacts
14. Evaluating the effectiveness of services.

For each of the 108 individuals in the subgroup, a vector of 14 values was formed. Each value was the number of times the resource person was asked about a specific topic divided by the total number of different people who contacted the person. This value has a range between 0 and 1 and represents, for each resource person, the fraction of individuals who contacted them with respect to a particular rural mental health topic. For example, if a person was asked four times about federal funding and had ten different people contact him/her for information on any issue, then the value for this individual on the specific issue was set to 0.4.

A cluster analysis procedure was used to group the 108 test-name individuals on the basis of similarity regarding the pattern of issues about which they were contacted. In general, cluster analytic procedures ascertain those observations that have similar attributes and place those observations into a distinct cluster. The specific cluster analytic procedure that was used in the present study was an agglomerative hierarchical procedure. With N observations, this procedure begins with N clusters, where each cluster is represented by one observation; then the most similar pair of clusters is merged and the number of clusters is reduced to N-1. This process continues until all observations are members of a common cluster.

Inspection of the goodness of fit values associated with the various clustering solutions revealed that a five-cluster solution was optimal. (Table XXXIV displays the average percentage of individuals who asked the members of each cluster for information about the rural mental health issues).

The first cluster consisted of 63 individuals (i.e., 59% of the subgroup) who were consulted on a number of different issues. The percentage of requests received from different individuals was less than 30% for any specific issue. Thus, 28% of the people who

TABLE XXXIV

PERCENTAGE OF RESPONDENTS WHO CONTACTED A MEMBER OF A SPECIFIC CLUSTER ABOUT DIFFERENT ISSUES

Cluster Number	Number of Persons in the Cluster	ISSUES													
		Research Issues	Transportation	Government Regulations	Recruiting and Retaining Personnel	Stimulating Community Support	Coordination	Federal Funding	Service Techniques	Reducing Cost of Services	Third Party Reimbursement	Continuing Education	Special Needs of Rural Populations	Maintaining Professional Contacts	Evaluating Effectiveness of Services
1	63	22%	2%	16%	8%	12%	24%	18%	8%	2%	3%	28%	26%	22%	11%
2	3	4	65	11	0	14	18	17	0	0	0	5	10	0	0
3	6	63	2	4	[illegible]	6	8	30	1	3	0	13	47	22	17
4	34	10	0	48	8	7	23	50	8	1	8	17	14	16	10
5	2	0	9	79	19	16	47	26	37	19	12	0	25	0	49

contacted individuals in this cluster sought information related to continuing education; 26% sought information on special needs of rural populations; 24% sought information on coordination; 22% sought information on maintaining professional contacts. (Note that the percentages total more than 100 because each person-to-person contact may involve information-seeking on multiple topics.)

The second cluster consisted of three individuals who were contacted primarily about transportation issues (65%). All three work as transportation specialists.

The third cluster consisted of six individuals. These people were contacted primarily on the topics of research issues (63%) and special needs of rural populations (47%). Four of these people are at universities and two work for federal agencies.

The fourth cluster consisted of 34 individuals who were contacted primarily in regard to federal funding (50%) and government statutes and regulations (48%). Most of these people are federal officials; 21 work in federal regional offices and six are located in Washington, D.C.

The fifth cluster consisted of two individuals who were primarily contacted in regard to government statutes and regulations (79%), evaluating the effectiveness of services (49%), and coordination (47%). One of these people is a state level official, the other is a director of a mental health center.

Based on the above, it appears that the communication network is not highly differentiated, since the majority of informtion providers (those in Cluster 1) are contacted with respect to a variety of issues. On the other hand, requests appear to be directed to appropriate individuals for topics that require specialized knowledge--particularly in areas outside of those traditionally associated with mental health services. Thus transportation specialists (Cluster 2) are grouped together because most (65%) of the people who contact them are seeking information about transportation issues. Similarly, most people seeking information from individuals in Cluster 4, comprised primarily of federal officials, seek information about federal funding and/or government statutes and regulations.

4.3 Summary of Findings

Analysis of the contacts made by individuals show little interorganizational person-to-person communication related to rural mental health. Fourteen percent (14%) of all respondents (n=1666) did not contact anyone outside their organization for information during the year preceeding the survey. Each of the 1,277 individuals (76%) who reported making such contacts contacted an average of four individuals. These findings are consistant with those indicating that the average survey respondent sought information related to a rural mental health problem from outside their organization only 1.4 times per year.

The fact that 80% (2,299) out of the 2,861 individuals who provided information to survey respondents were contacted for information by only one respondent (90% were contacted by 2 or fewer) implies that the network is fragmented. This finding is supported by the fact that only 0.081% of the potential communication links among individuals were reported.

Despite the apparent fragmentation of the person-to-person communication network, 71% of the individuals who participated in such communication (n=3679) were linked together either directly or through one or more intermediaries. The extent of this linkage is comparable to that observed in basic science communities. It can be explained by the existance of nodal persons who receive a large number of requests for information. The existance of nodal individuals is demonstrated by the fact that 19 out of the 2,861 individuals who were identified as information providers were contacted by 30-100 persons each, as compared with the 1.9 persons who, on the average, contacted an information provider. These nodal individuals tend to hold positions of importance and visibility (e.g., as directors of associations or federal officials). They tend to be contacted about a wide variety of topics, rather than about a few specific issues. Those information providers who have a specific area of expertise (e.g., transportation) are, however, contacted primarily about that area.

The fact that 71% (2,627) of the individuals participating in person-to-person communication (n=3679) were linked together, and that none of the other groups of individuals that were identified contained more than 21 individuals, suggests that communication in the field does not occur wholly within discrete groups of individuals that are characterized by a common professional background, work setting, or geographical location. There is, however, a strong tendency for people to communicate with others who have similar characteristics. Thus, contact between individuals who have the same professional title is 4.7 times that expected; individuals who work in the same type of organization contact each other 3.4 times as often as expected; and those who reside in the same state contact each other 16.5 times as frequently as expected.

5.0 DISCUSSION

The preceding analyses of information seeking behavior in the field of rural mental health can be used to develop strategies for improving the flow of information in that field, or in similar fields that include researchers, practitioners, and policy makers.

The findings simultaneously show a paucity of interorganizational information seeking and the importance of person-to-person communication (both inter- and intraorganizationally) in information seeking. While the structure of the informal communication network in this field is similar to the invisible colleges observed in basic science disciplines (Crane 1972, Price 1963) the infrequent use of information sources outside an individuals own organization mirrors the pattern of communication that has been reported for technologists (Marquis and Allen 1966; Rosenbloom and Wolek 1970; Johnston and Gibbons 1975; Utterback 1971) and workers in human science fields (Tagliacozzo et al. 1971; Magisos 1971; Roberts and Larsen 1971). These findings, combined with the high value placed on person-to-person communication, suggest that strategies to improve the flow of information might focus on facilitating contact between individuals in separate organizations.

Analyses of the person-to-person communication network have shown that the network is highly centralized but shows little differentiation with respect to topic. Contact occurs most frequently among "similar" individuals, or those who have the same professional background, work in the same type of organization, or are in close geographical proximity. These findings are consistent with research showing that information sources tend to be chosen on the basis of perceived ease of use, rather than on the basis of the amount of information expected from the source (Rosenberg 1967). It appears to be easier for someone seeking information to contact a person with a similar background, and who is in close geographical proximity, than it is to contact an individual who has less in common with the individual requesting the information. We tend to contact people whom we know through professional association, even though these people may not be able to provide the most extensive or most current information with respect to a given topic.

These findings suggest that information transfer might be improved by making it easier for those seeking information to contact someone who has expertise in the specific area(s) in which information is needed. Since the individuals who occupy central positions in the network are also those who possess authority or influence (e.g., federal officials and heads of associations), it is particularly important that they know of individuals with specific expertise. Since they are central, they can refer those seeking information to the appropriate person(s). Since they occupy positions of authority, it is important that they have access to information themselves.

Individuals with expertise in specific areas might be identified with respect to topics that are defined a priori (e.g., requirements for third party reimbursement, the demographics of rural areas). While this strategy is frequently useful, it does not take into account the fact that an information seeking episode, and the problem that stimulated the episode, generally encompass more than one topic. Three topics, on the average, were included in each episode reported in the rural mental health survey. An alternate strategy, possibly more effective in an applied field like rural mental health services, is to identify individuals with expertise in specific "problem" areas (e.g., obtaining funding for indigent clients, identifying elderly residents who are in need of services). While the problem areas can, as with the topics, be defined *a priori*, the strategy should allow the identification of individuals working to solve any problem that is likely to be faced by persons in the field. This could most easily be accomplished by encouraging individuals to "self-report" research findings and/or innovative practices that have been developed.

Based on the above, strategies for increasing the transfer of information should:

- be based on facilitating contacts between individuals
- include individuals from a wide variety of backgrounds
- involve those individuals with authority and influence in the field
- encourage individuals to report important findings or accomplishments.

The authors recognize that there are two major difficulties in implementing an information strategy based on the preceding considerations. First, while written material is less used, and less useful, as a source of information than person-to-person contacts (except, possibly, for researchers at universities), some sort of written material needs to be produced to describe the information that is available from individuals. Second, those seeking information need some way of verifying that the person whom they are contacting can provide information that is appropriate to their problem and that is sufficiently tested to meet their needs.

Both of these potential difficulties can be ameliorated through appropriate "packaging" of information. Brief summaries of findings can be prepared and provided to those seeking information along with the name(s) of individuals to contact for further information. To assist the individual who is seeking information assess the appropriateness of the findings, these summaries should describe the major issue(s) or problem(s) addressed and characteristics of the agency(s) where the findings are being implemented. Mental health procedures that are appropriate for a state hospital may not be appropriate for a rural clinic. Farming technology that increases yield on a large wheat farm in Kansas may not be appropriate for a family farm in West Virginia. The summary should, where appropriate, describe the population groups likely to be impacted by implementation of the findings, evidence of the need for implementing the findings, resources that are required, and special circumstances that were (or will be) important to successful implementation. While the need for such information seems obvious in the case of human service programs, it may also be helpful in assisting individuals who are engaged in physical science or biological research to assess the appropriateness of findings in their field. The fact that a given procedure requires a specific strain of mouse, or silicon of heretofore unobtainable purity, should be reported. For findings that will change the function of an organization (e.g., through a change in management practices), the groups of individuals who were (or are) in favor of or opposed to the change should be noted. Potential adopters of findings can evaluate the validity of the findings if the summary states the benefits that have been demonstrated and the indicators used to assess or measure these benefits. While a brief summary can not include all the information needed by a potential user, it should indicate that types of additional information are available (e.g., procedure manuals, detailed evaluations of effectiveness) and how they can be obtained.

The appropriate medium for disseminating information about sources of expertise (in the form of the brief summaries described above), and the appropriate mechanisms for encouraging contact between those seeking information and individuals who have expertise in the required areas, will depend on characteristics of the field and of individuals in the field. In fields where the technology is changing rapidly, the problems are well defined in scope, the information that is needed is often in the form of raw data (e.g., equipment specifications), and/or the individuals in the field are accustomed to using computers, on-line computer systems may be the most appropriate medium. In fields where one or more of these conditions do not hold, or where the problems tend to be more diffusely defined, other media may be useful. Newsletters, magazines, or journals can provide an appropriate medium, as can Information and Referral (I&R) services run by organizations in the field.

Many mechanisms can be used to encourage individuals who need information to contact those who may be able to provide the information. The authors believe that dissemination of brief summaries of findings, through an appropriate medium, will encourage such contact. These summaries will provide the individual who is seeking information with a clear idea of the problems that a potential information provider was addressing, and of the context in which findings are, or might be, applied. Another mechanism is provided by conferences or workshops that focus on a specific problem area. These provide an opportunity for those who need information about a problem to meet individuals who have developed (or are developing) solutions to that problem. The formation of formalized "networks of consultants," or the establishment of toll-free telephone numbers, may also help encourage person-to-person contact.

In summary, the authors believe that the results of this study of communication in the field of rural mental health services can be useful in designing strategies for improving the transfer of information. These results demonstrate the importance of person-to-person communication and suggest that such communication might be improved if mechanisms were developed that made it easier for those seeking information to identify appropriate experts and, at the same time, assist these individuals in assessing the appropriateness and validity of the information available from a given expert.

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APPENDIX I

RURAL MENTAL HEALTH SURVEY FORM

INTRODUCTION

You are receiving this survey because of your interest in rural mental health. When you return this questionnaire about your information needs to us, we will:

- Send you (immediately) a report on "Research Directions for Rural Mental Health," prepared by MITRE in collaboration with the National Institute of Mental Health. The report identifies areas in which research is needed to develop solutions to problems in delivering mental health services.
- Enter your name to receive a newsletter that will contain brief articles written by individuals in the field, abstracts of relevant journal and research reports, and announcements of interest to service providers in rural communities.

The newsletter will be one activity of an "R&D Resource Center for Rural Mental Health." The Center is being designed as a source of problem-solving information for people who provide and develop services, and for those engaged in research.

This survey will provide us with information to help ensure that the "R&D Resource Center" meets your needs. Your answers will be confidential; the analysis will not disclose individual sources of information.

To return the survey just fold and staple it as indicated (so our address is on the outside). Directions are printed with each question.

Please help us by providing: ☐☐☐☐1 (1-5)

Your Name ____________________

Organization/Agency ____________________

Work Address ____________________

____________________ ☐☐ (6-7)

Position/Title ____________________ Telephone No. ____________________

If your work DOES NOT involve you in any way with issues concerning mental health in rural areas, please check the box and return. (We will remove your name from our mailing list.)

☐ (8)
Not involved

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GOOD! We were right in identifying you as someone who could tell us what kind of information is needed about rural service delivery problems and where people now get this information. Telling us about yourself in the following questions will help us interpret the results of this survey.

1. I have worked in my present organization for _______ years. (8-10)
My previous position (or educational institution) was located in

(City/State) ____ ☐☐ (11-12)

2. Please estimate the percentage of your work devoted to the following activities over the last year. Your estimates should not be restricted to rural mental health activities. The total should equal 100%.

(13) _____ % PROVIDING services

(16) _____ % MANAGING/ADMINISTERING/PLANNING service or training programs

(19) _____ % CONDUCTING RESEARCH and/or MANAGING RESEARCH program(s)

(22) _____ % TEACHING, TRAINING, or CLINICAL SUPERVISION

(25) _____ % STUDENT

(28) _____ % Other (Please specify) ______________________

100% Total

(31)

3. I spend approximately _______ % of my time in activities related to health, mental health, or human services in rural areas.

4. Estimate the percentage of your work effort related to:

(34) _____ % HEALTH services

(37) _____ % MENTAL HEALTH services

(40) _____ % OTHER HUMAN services

100% Total

5. Please circle the code letter for the ONE description that BEST FITS your work related to rural mental health.

(43) A Physician
B Psychiatrist
C Psychologist
D Nurse
E Social Worker
G Manager/Administrator
H Researcher
I Student
J Teacher
K Volunteer
F Other (Please Specify) ______________________

____

6. Please circle the code letter for the ONE description that BEST FITS the type of organization in which you work.

(44) A Local Health/Mental Health Facility
B City or County Government
C State or Regional Hospital
D State Government
E Federal Regional Office
F Federal Government, Washington, D.C.
G University
H Regional or National Advocacy Group
I Other (Please Specify) ______________________

____

7. We are trying to find out how much communication occurs among different occupational groups. The following list of names was selected from diverse sources. Individuals were chosen to represent the wide variety of groups involved with the delivery of mental health services in rural areas. Because of this diversity, we do NOT expect that you will recognize most of the names on this list.

Please read the directions carefully. Select one of the descriptions heading the first four columns to indicate your familiarity and contact with each person. If you have sought advice from a person, check the fourth column and indicate the number of times you have contacted that person and the subject(s). Leave a blank after the names of people in your work unit. Your work unit may be a service facility, a division or regional office of a large organization, or a university department.

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- Place a check in one of the first four columns to indicate how well you know each person on the list. Do not check any boxes following the name of persons in your work unit.

(1) I have never heard of this person.
(2) I am familiar with the name, but have never had any contact.
(3) I have had contact with this person, but have not sought their advice within the last year.
(4) I have sought advice from this person within the last year.

If (4) is checked complete this part of Questionnaire.

How many times have you contacted this person in the last year?

I have asked for advice about: (Enter codes of up to 4 items)

(A) Research issues
(B) Transportation
(C) Governmental statutes and regulations
(D) Recruiting and retaining personnel
(E) Stimulating community support
(F) Coordination
(G) Federal funding
(H) Service techniques or protocols
(I) Reducing cost of services
(J) Third party reimbursement requirements
(K) Education/training
(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

Other subjects not specified in codes.

(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times	Advice	Advice	Advice	Advice	Other subjects not specified in codes.		
Mary Alice Miller											(6-12)	2 (5)
Marion Primas											(13-19)	
David See											(20-26)	
Peter Vaslow											(27-33)	
Barbara Burns											(34-40)	
Rhett Potter											(41-47)	
Mary Harper											(48-54)	
John White											(55-61)	
Edward Hassinger											(62-68)	
Douglas Brooks											(69-75)	
Elmer Ediger											(6-12)	3 (5)
Robert Waggener											(13-19)	
Fred Matthews											(20-26)	
James Fowler											(27-33)	
Marilyn Rosenstein											(34-40)	
Jack Salvesen											(41-47)	
Robert Vickers											(48-54)	
Patricia LaBach											(55-61)	
Jessie Dowling											(62-68)	
Walter Gleason											(69-75)	

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(E) Stimulating community support
(F) Coordination
(G) Federal funding
(H) Service techniques or protocols
(I) Reducing cost of services
(J) Third party reimbursement requirements
(K) Education/training
(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

Other subjects not specified in codes.

(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times					Other subjects not specified in codes
Hector Gomez										(6-12)
Norman West										(13-19)
William Wright										(20-26)
Donna Manczak										(27-33)
David Ravella										(34-40)
Stanley Mahoney										(41-47)
Glen Rollins										(48-54)
Stephenie Stolz										(55-61)
Candace King										(62-68)
Dan Cardenas										(69-75)
Peter Pornish										(6-12)
John Wolfe										(13-19)
Richard Mills										(20-26)
Michael Miller										(27-33)
Gene Crawford										(34-40)
Robert Applebaum										(41-47)
Joseph Hoffmann										(48-54)
Kato Jesberg										(55-61)
John Carver										(62-68)
William Simpson										(69-75)

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(J) Third party reimbursement requirements
(K) Education/training
(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times	Code	Code	Code	Code	Other subjects not specified in codes.		
Suzanne Sobel											(6-12)	6 (5)
Carolyn Mills											(13-19)	
Joe Baldi											(20-26)	
Alice Hersch											(27-33)	
Elliot Allman											(34-40)	
Gordon Hoke											(41-47)	
Bryce Hughett											(48-54)	
Douglas McKelvey											(55-61)	
Gordon Thomas											(62-68)	
Cecil Lockhart-Smith											(69-75)	
Robert Thomas											(6-12)	7 (5)
Bill Blockstein											(13-19)	
Steven Sharfstein											(20-26)	
Thomas Butler											(27-33)	
Lucy Ozarin											(34-40)	
Joie Hartman											(41-47)	
Leon Ginsberg											(48-54)	
Bill Carigan											(55-61)	
Leon Nicks											(62-68)	
Vera French											(69-75)	

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(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times have you contacted this person in the last year?	I have asked for advice about				Other subjects not specified in codes.	
Norman Dolch											(6-12) ☐8 (5)
Tresa Matthews											(13-19)
Ron Ruggles											(20-26)
Julian Samora											(27-33)
Marvin Konyha											(34-40)
Armando Pollack											(41-47)
Robert Arrindell											(48-54)
Jesse Walker											(55-61)
Jules Asher											(62-68)
Rodger Kessler											(69-75)
Norma Baxter											(6-12) ☐9 (5)
Sara Ketron											(13-19)
Bertha Atelsek											(20-26)
William Huddleston											(27-33)
Baqar Husaini											(34-40)
Carole Lindman											(41-47)
Harold McPheeters											(48-54)
James Longest											(55-61)
John Biedenkapp											(62-68)
Hale Pringle											(69-75)

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(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

(1-4) ☐☐☐☐

Other subjects not specified in codes.

	(1)	(2)	(3)	(4)	How many times					Other subjects not specified in codes.		
Saul Feldman	☐	☐	☐	☐							(6-12)	A (5)
Jim Flax	☐	☐	☐	☐							(13-19)	
Alex Michalos	☐	☐	☐	☐							(20-26)	
Dennis Watkins	☐	☐	☐	☐							(27-33)	
Victor Christopherson	☐	☐	☐	☐							(34-40)	
Barbara Brown	☐	☐	☐	☐							(41-47)	
William Gingolo	☐	☐	☐	☐							(48-54)	
Lynn Gunn	☐	☐	☐	☐							(55-61)	
Brian Flynn	☐	☐	☐	☐							(62-68)	
Finbarr O'Connell	☐	☐	☐	☐							(69-75)	
Richard Stadter	☐	☐	☐	☐							(6-12)	B (5)
Lois Sabin	☐	☐	☐	☐							(13-19)	
Louise Gerrard	☐	☐	☐	☐							(20-26)	
Boris Gertz	☐	☐	☐	☐							(27-33)	
Kenneth Nyberg	☐	☐	☐	☐							(34-40)	
Lamar Neville	☐	☐	☐	☐							(41-47)	
Al Gonzalez	☐	☐	☐	☐							(48-54)	
Lindsley Williams	☐	☐	☐	☐							(55-61)	
Bill Hanna	☐	☐	☐	☐							(62-68)	
Bernadine Bednarcz	☐	☐	☐	☐							(69-75)	

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(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times	Code	Code	Code	Code	Other subjects not specified in codes.		
Wilfred Higashi											(6-12)	C (5)
Harriet Barlow											(13-19)	
Gerald Doeksen											(20-26)	
P[illegible]ricia Creasly											(27-33)	
Harry Schnibbe											(34-40)	
Vincent Mehmel											(41-47)	
Albert Meuli											(48-54)	
Connie Bilger											(55-61)	
James Seaton											(62-68)	
Bob Trickett											(69-75)	
Ron Bryant											(6-12)	D (5)
Je[illegible]nette Chamberlain											(13-19)	
Robert Weiss											(20-26)	
Maurice Miller											(27-33)	
Myrick Pullen											(34-40)	
Diana Mireles											(41-47)	
Samuel Braziel Jr.											(48-54)	
Dan Willford											(55-61)	
Jack Bartleson											(62-68)	
Gilbert Aliber											(69-75)	

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(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

Other subjects not specified in codes.

(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times					Other subjects not specified in codes		
Jerome Ashford											(6-12)	E (5)
Jo Costello											(13-19)	
Michael Hamm											(20-26)	
Delmar Yoder											(27-33)	
Dwight Reiman											(34-40)	
Nancy Lane											(41-47)	
Charles McArthur											(48-54)	
Harry Ferguson											(55-61)	
Ernest Land											(62-68)	
Frank Lane											(69-75)	
Marion Lupo											(6-12)	F (5)
Dan Wilson											(13-19)	
Pacila Gregos											(20-26)	
Shirley Weston											(27-33)	
Thomas Grunden, Jr.											(34-40)	
Kim Halladay											(41-47)	
William Atherton											(48-54)	
Bruce Weik											(55-61)	
Morton Wagenfeld											(62-68)	
Morton Albert											(69-75)	

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(K) Education/training
(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

(1-4) ☐☐☐☐

Other subjects not specified in codes.

	(1)	(2)	(3)	(4)	How many times	Code	Code	Code	Code	Other subjects not specified in codes.	
Beth Arrow										(6-12)	G (5)
William Hollister										(13-19)	
Gordon Cummings										(20-26)	
Rebecca Ashery										(27-33)	
Michael Houlihan										(34-40)	
Raymond Coward										(41-47)	
Carol Riddick										(48-54)	
Sam Leadley										(55-61)	
Beverly McBride										(62-68)	
Lanny Landry										(69-75)	
Robert Roddy										(6-12)	H (5)
James McCorkel										(13-19)	
Cheryl Harkins										(20-26)	
John Westerholm										(27-33)	
Jack Kryouski										(34-40)	
Emory Brown										(41-47)	
Lois Gage										(48-54)	
Michael Williams										(55-61)	
Reba Page										(62-68)	
Harold Jordan										(69-75)	

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(J) Third party reimbursement requirements
(K) Education/training
(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times	Code	Code	Code	Code	Other subjects not specified in codes.	
Neil Balkman										(6-12)	I (5)
Anson Haughton										(13-19)	
Robert Church										(20-26)	
Paul Chalfant										(27-33)	
Stuart Howell										(34-40)	
Daun Martin										(41-47)	
Theodore Fasso										(48-54)	
Kenneth Phillips										(55-61)	
Hector Sanchez										(62-68)	
Bonnie Sharp										(69-75)	
Karen Rittiger										(6-12)	J (5)
David Fenton										(13-19)	
Juan Chavira										(20-26)	
Robert Anderson										(27-33)	
Linda Hadley										(34-40)	
George Brooks										(41-47)	
Mitchell Ginsberg										(48-54)	
Charles Willie										(55-61)	
Robert Carrick										(62-68)	
Neil Adams										(69-75)	

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- Place a check in one of the first four columns to indicate how well you know each person on the list. Do not check any boxes following the name of persons in your work unit.

(1) I have never heard of this person.
(2) I am familiar with the name, but have never had any contact.
(3) I have had contact with this person, but have not sought their advice within the last year.
(4) I have sought advice from this person within the last year.

If (4) is checked complete this part of Questionnaire.

How many times have you contacted this person in the last year?

I have asked for advice about: (Enter codes of up to 4 items)

(A) Research issues
(B) Transportation
(C) Governmental statutes and regulations
(D) Recruiting and retaining personnel
(E) Stimulating community support
(F) Coordination
(G) Federal funding
(H) Service techniques or protocols
(I) Reducing cost of services
(J) Third party reimbursement requirements
(K) Education/training
(L) Special needs of rural populations
(M) Maintaining professional contacts
(N) Evaluating the effectiveness of services

(1-4) ☐☐☐☐

	(1)	(2)	(3)	(4)	How many times					Other subjects not specified in codes.	
Charles Crawford										(6-12)	K (5)
Berkley Hathorne										(13-19)	
Herman Culpepper										(20-26)	
Sam Cordes										(27-33)	
Frank Davis										(34-40)	
Stephen Huber										(41-47)	
Martin Keeley										(48-54)	
David Hargrove										(55-61)	
Phillip Swihart										(62-68)	
Ruth Lewis										(69-75)	
Peter Blouke										(6-12)	L (5)
Sam Silverstein										(13-19)	
Jay Feldman										(20-26)	
Dorine Loso										(27-33)	
Sean O'Rourke										(34-40)	
Peter Gore										(41-47)	
James Neff										(48-54)	
Arthur Funke										(55-61)	
Sally Winters										(62-68)	
Ed Flynn										(69-75)	

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☐☐☐☐☐ M (1-5)

8. Name up to five people outside your own work unit who are not on the list and whom you have asked for advice related to rural mental health within the last year. Indicate the number of times and topics.

Name ______________________ (6) ☐☐☐☐
Organization ______________________
No. of Contacts ______ (10) Topics* ______ (11) ______ (12) ______ (13) ______ (14)

Name ______________________ (15) ☐☐☐☐
Organization ______________________
No. of Contacts ______ (19) Topics* ______ (20) ______ (21) ______ (22) ______ (23)

Name ______________________ (24) ☐☐☐☐
Organization ______________________
No. of Contacts ______ (28) Topics* ______ (29) ______ (30) ______ (31) ______ (32)

Name ______________________ (33) ☐☐☐☐
Organization ______________________
No. of Contacts ______ (37) Topics* ______ (38) ______ (39) ______ (40) ______ (41)

Name ______________________ (42) ☐☐☐☐
Organization ______________________
No. of Contacts ______ (46) Topics* ______ (47) ______ (48) ______ (49) ______ (50)

*Use the codes from item 7 or describe.

9. Please tell us how important the following sources of information are to you in your rural mental health related work.
Place a check in the column following each source indicating how you rate its importance.

SOURCES	DEGREE OF IMPORTANCE 1 None	2 Slight	3 Moderate	4 Major	5 Critical	
Research Reports						(51)
Periodicals						(52)
Continuing education / training courses						(53)
Conferences/meetings						(54)
State level staff						(55)
HEW regional office staff						(56)
HEW central office staff						(57)
Colleagues in your organization						(58)
Colleagues outside your organization						(59)

Other (please specify) ______________________
____
____
____
____

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☐☐☐☐☐ (1-5)

10. Please try to recall the LAST TIME you actively sought advice or information from outside your work unit to help solve a substantial problem related to rural mental health.

A. Indicate the month and year when this occurred (6) ☐☐ Month 19 (8) ☐☐ Year

B. Check those subject(s) you sought advice about at this time.

(10) ____ Research issues

(11) ____ Transportation

(12) ____ Governmental statutes and regulations

(13) ____ Recruiting and retaining personnel

(14) ____ Stimulating community support

(15) ____ Coordination

(16) ____ Federal funding

(17) ____ Service techniques or protocols

(18) ____ Reducing cost of services

(19) ____ Third party reimbursement requirements

(20) ____ Opportunities for continuing education

(21) ____ Special needs of rural populations

(22) ____ Maintaining professional contacts

(23) ____ Evaluating the effectiveness of services

(24) ____ Other (please specify) ____________________

11. Please indicate which of the following information sources you used the last time you sought consultation or advice related to rural mental health, and how useful you found them, according to the following scale. Check the appropriate column for each source.

	1 Did Not Use	2 Used—No Value	3 Used—Slight Value	4 Used—Moderate Value	5 Used—Great Value	6 Used—Critical Value	
Research Reports							(25)
Periodicals							(26)
Continuing education/training courses							(27)
Conferences/meetings							(28)
State level staff							(29)
HEW regional office staff							(30)
HEW central office staff							(31)
Colleagues in your work unit							(32)
Colleagues outside your work unit							(33)

Other (please specify) ____________________

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12. Look through the list of publications below. Please tell us how useful you find each publication in your rural mental health related work. (NOTE: Some of these are regional or specialized publications; it is likely that many will be unfamiliar to you.)

The rating categories are explained below. Read them over carefully. Place a check in the appropriate column followng the name of each publication.

Don't Know:	I am unfamiliar with this publication.
Not Useful:	I am familiar with the contents of this publication and have not found it useful.
Moderately Useful:	Over the past two years I have gotten some information from this publication that has helped me with my work.
Very Useful:	Over the past two years I have frequently gotten information from this publication that has helped me with my work.

PUBLICATION **DEGREE OF USEFULNESS**

	1 Don't Know	2 None	3 Moderate	4 Very	
Rural Sociology					(34)
Hospital & Community Psychiatry					(35)
American Journal of Orthopsychiatry					(36)
Innovations Magazine					(37)
Rural Health Communications					(38)
Community Mental Health Journal					(39)
American Journal of Community Psychology					(40)

(List continued on right)

PUBLICATION **(List continued)** **DEGREE OF USEFULNESS**

	1 Don't Know	2 None	3 Moderate	4 Very	
American Journal of Psychotherapy					(41)
Community Mental Health Journal					(42)
Administration in Mental Health					(43)
Evaluation Magazine					(44)
Public Health Reports					(45)
American Psychologist					(46)
American Journal of Psychiatry					(47)
Rural Community Mental Health Newsletter					(48)
Journal of Health and Social Behavior					(49)
Social Problems					(50)
Community Mental Health Review					(51)
Social Work					(52)
Social Service Review					(53)

Please list any other publications that you have found VERY USEFUL in your work related to rural mental health.

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________

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13. Please help us ensure that the R&D Resource Center for Rural Mental Health meets your needs by telling us how useful you would find each of the following activities. Place a check in the column following each activity to rate its usefulness.

SOURCES	DEGREE OF USEFULNESS 1 None	2 Slight	3 Moderate	4 Major	5 Critical	
Summarizing relevant research findings						(54)
Reporting on innovative approaches developed in rural settings						(55)
Providing a consultant referral service						(56)
Coordinating workshops on specific service delivery problems						(57)
Conducting bibliographic searches on topics related to service delivery						(58)
Providing copies of government or research reports						(59)
Organizing annual conferences						(60)
Putting me in touch with others who are trying to solve similar problems						(61)
Assisting in the design of research/evaluation projects						(62)

Other (please specify) ____________________

____

14. Please check the professional associations and interest groups to which you belong. List other relevant organizations to which you belong.

(63) ____ American Medical Association

(64) ____ American Nurses' Association

(65) ____ American Psychological Association

(66) ____ American Psychiatric Association

(67) ____ American Public Health Association

(68) ____ Association for Rural Mental Health

(69) ____ Association of Mental Health Administrators

(70) ____ Mental Health Association

(71) ____ National Association of Social Workers

(72) ____ National Rural Primary Care Association

Other (Please specify) ____________________

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15. Do you have any other comments? ____________________

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MITRE Department
and Project Approval: ____________________